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HOME CARE OF RHEUMATIC FEVER PATIENTS

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In October, 1948, a two-and-a-half-year pilot project for home care of children with active rheumatic fever was instituted at Montefiore Hospital, New York City. This project was sponsored by the New York Heart Association and was an extension of the home care program begun at Montefiore Hospital in 1947.[1] The purpose of the project was to determine whether a standard of care comparable to that given in a general hospital or in a specialized institution for the care of patients with rheumatic fever could be given in the home with perhaps greater over-all benefit to the child. The program also covered the emotional and social problems of the rheumatic fever patient and his family. This report, however, is limited to the medical aspects of the program.

ORGANIZATION

The children included in the program were drawn from the geographical area of upper Manhattan and Bronx County of New York City, an area roughly 20 miles long and 6 miles wide. They were referred from various sources including the wards and clinic of Montefiore Hospital and other voluntary and municipal hospitals in the city, private physicians, and various social and voluntary agencies, including the New York Heart Association. Some patients who had been receiving care elsewhere were self-referred.

All the children were examined at home or at the referring hospital by one of us. The presence of active rheumatic fever requiring continued care at bed rest was established by clinical examination and appropriate laboratory tests. The suitability of the home situation was determined by the examining physician and the social worker. The evaluation process included a home visit in every case, and pertinent information was obtained from social workers or agencies that had had previous contact with the family.

Fairly rigid criteria were necessary in establishing the suitability of the home for the type of care planned. The following minimal standards were established: (1) the inability of the family to afford the necessary medical care on a private basis, (2) the willingness and ability of the parents or parent (broken homes were frequently encountered) to undertake a long, exacting regimen of unpredictable duration and outcome, and (3) a suitable physical environment so that the child could have his own bed and, preferably, his own room for the purpose of isolation from respiratory infection in the home.

On the basis of these criteria, of the 88 applicants during the 30 month span of the program, 45 were accepted, while 43 were rejected or withdrew their applications when the program was explained to them in detail. Twenty-one applicants were rejected because their rheumatic fever was no longer active, or the disease was not diagnosed as rheumatic fever, 18 because of inadequate home environment or uncooperative family, and 4 for various other reasons.

The care of the child in the home was maintained by a staff of two internists, a psychiatrist, a psychologist, a psychiatric social worker, a dietitian, and an occupational therapist. The Visiting Nurse Service of New York supplied nursing care, and dental care was available at home when indicated. Children who required hospitalization during the program were admitted to a special rheumatic fever ward on the medical service at the hospital. Here we continued their supervision. On discharge from the hospital, most of the children were returned to the program. After rheumatic activity had subsided patients were discharged from the home care program to the care of the family physician. If no family physician was available the child was followed in the Montefiore children's cardiac clinic. The internists associated with the program were also on the staff of this clinic; thus, a continuity of medical care was established.

PLAN OF MEDICAL CARE

Each patient was seen by one of the internists at least once weekly and more often as indicated. Patients with congestive heart failure required more frequent visits.

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Drs. T. Duckett Jones and Ann G. Kuttner of New York and Dr. Benedict F. Massell of Boston assisted in the initiation and organization of the program.
This study was supported by a grant from the New York Heart Association and initiated as a pilot project for the New York Heart Association in October, 1948.
1. Cherkasky, M.: The Montefiore Hospital Home Care Program, Am. J. Pub. Health **39**: 163, 1949.

The mother was oriented in regard to the chronic course of the disease and was instructed to call the physician if anything unusual happened. Emergency service was always available, but the number of emergency house calls was very small.

When the child entered the program, a regimen of complete bed rest was continued or initiated. The mother was instructed by the visiting nurse in general methods of nursing care, such as giving bed baths, taking rectal temperatures, and counting the pulse. The mother maintained a chart consisting of pulse and temperature records at four-hour intervals, daily sleeping pulse rate, and weekly weight, except for patients with congestive heart failure in whom daily weights were recorded.

Shortly after a child was admitted to the program the mother was asked to keep a detailed list of the child's food intake for a week. The dietitian evaluated the diet as to qualitative and quantitative adequacy, interviewed the mother, and suggested appropriate changes in keeping with the financial status of the family. The dietitian made repeated visits to supervise the home diet. She was particularly helpful in outlining the low-salt diet when it was necessary and in demonstrating methods for increasing its palatability. In some cases exogenous obesity required the reduction of caloric intake. Supplementary vitamins were added to the diet of all the children. Routine monthly laboratory procedures included electrocardiogram, complete blood cell count and erythrocyte sedimentation rate, nose and throat cultures, and determination of antistreptolysin titer. Nose and throat cultures were also taken at frequent sporadic intervals. When respiratory infection was found, daily cultures were taken from the patient and also from the contacts when possible. A special laboratory for the grouping and typing of streptococci was set up in the hospital bacteriology department. Antistreptolysin titers also were determined oftener than once a month if hemolytic streptococci were found in nose and throat cultures.

Clinical End-Results of Home Care Program

	Cardiac Status		Status of Rheumatic Fever at Discharge from Program	
	When Accepted	When Discharged	Inactive	Active
Group 1: asymptomatic rheumatic fever (20 patients)	13	13 †	16 (Average of 15 mo. on program)	4 (Average of 6 mo. on program)
Organic heart disease				
"Potential" heart disease *	7	7		
Group 2: symptomatic rheumatic fever (15 patients)	10	10 ‡	10 (Average of 12 mo. on program)	5 (Average of 17 mo. on program)
Organic heart disease				
"Potential" heart disease *	5	5		
Group 3: rheumatic fever with congestive heart failure (10 patients)	10	10	4 (Average of 18 mo. on program)	3 (Average of 11 mo. on program §)
Organic heart disease				

* Nomenclature and Criteria for Diagnosis of Diseases of the Heart, New York Heart Association.
† Increased murmur in 1 case.
‡ Increased murmur in 2 cases.
§ Three patients died after an average of three months on the program.

The problem of the early recognition and treatment of respiratory infection presented a challenge. We were faced with two choices: either to administer penicillin to the child prophylactically or to investigate the possibility that such infection, even in the home, could be readily recognized clinically and bacteriologically and then treated in a sane and practical fashion. The latter course seemed to offer an opportunity to gain important information. The mother was, therefore, informed of the potential seriousness of respiratory infection in the rheumatic child and was advised to call the physician immediately if the child contracted a cold or had a sudden rise in ordinarily stable temperature. Cooperation was amazingly good, and the results were excellent.

When respiratory infection developed, nose and throat cultures were taken, and then the child was given penicillin, one million units a day orally in four divided doses, as suggested by Massell, Dow, and Jones.[2] This therapy was continued until it was established by repeated cultures that the infection was not streptococcic. If group A beta-hemolytic streptococci were found in the culture, penicillin therapy was continued for 10 days. Repeated cultures were made to establish the disappearance of such organisms. Courses of penicillin were also given orally to persistent carriers of group A beta-hemolytic streptococci unrelated to clinical infection.

Necessary dental work was done in the home by a staff dentist, with adequate prophylactic penicillin therapy given under the supervision of the internists. When dental work was too extensive to be done at home, the child was hospitalized for a brief period and then returned to the home care program.

RESULTS

Over the 30 month period covered by the program, 45 children with chronic active rheumatic fever or in the later stages of an acute attack of the disease were treated at home. There were 32 boys and 13 girls from 4 to 19 years old, with an average age of 11.7 years. The patients remained on the program an average of 12 months, but the periods varied from 1 to 29 months.

Over the period of observation, the patients fell into three groups: (1) 20 patients with asymptomatic rheumatic fever (clinical and laboratory evidence of an active process without subjective complaints), (2) 15 patients with symptomatic rheumatic fever (acute joint manifestations, chorea, erythema marginatum, epistaxis, and supraventricular tachycardia), and (3) 10 patients with rheumatic fever and congestive heart failure.

The table summarizes the clinical end-results of the program. Six patients were transferred out of the program to a specialized institution for rheumatic fever patients and three to the care of private physicians. The disease was active in all at the time of transfer. These patients were not transferred from the program because the disease process itself was too severe or too difficult to handle at home but because the home situation had deteriorated in relation to the minimal criteria established.

Periods of hospitalization were necessary for 22 patients during the home care program. In group 1, there was one admission for each of the following reasons: severe respiratory infection, rectal bleeding, more effective bed rest, and because the family of the patient had moved out of the district covered by the home care program. In group 2, two admissions were for severe exacerbation of rheumatic fever (for adrenocortical therapy), one each for supraventricular tachycardia and severe epistaxis, and two for diagnostic reasons. Seven

2. Massell, B. F.; Dow, J. W., and Jones, T. D.: Orally Administered Penicillin in Patients with Rheumatic Fever, J. A. M. A. 138: 1030 (Dec. 4) 1948.

admissions in group 3 were for intractable heart failure (two were hospitalized twice), one for auricular fibrillation, two for supraventricular tachycardia, and two for acute pericarditis.

Aside from a few exceptions (the patients hospitalized or transferred from the program) patients in groups 1 and 2 presented no medical problems that could not be adequately handled at home. Bed rest was maintained until rheumatic activity had subsided, and then gradual ambulation was initiated. The joint manifestations responded adequately to moderate doses of salicylates. Chorea presented no unusual problems. There was no definite conclusion as to whether the home environment was beneficial or detrimental to the course of chorea, for only three such cases were observed.

Group 3, patients with active rheumatic fever and congestive heart failure, posed the most difficult problems in regard to adequate home care. A low-sodium diet was prescribed for all the patients, but it was difficult to induce the children to follow it. Lack of palatability was the chief reason, especially in regard to the reconstituted, salt-free milk powder, despite efforts to improve the taste. Digitalis was generally ineffective except in cases of auricular fibrillation. Use of mercurial diuretics frequently was necessary as determined primarily by the daily weight increase.

Despite the much greater risk of exposure to respiratory infection in these rheumatic children as compared to hospitalized rheumatic fever patients, the incidence of respiratory infection was surprisingly low. Approximately 40% of the children did not sustain any respiratory infection. In the early phases of this study, when a respiratory infection was recognized, nose and throat cultures were taken, and the patient was immediately placed on the daily dosage of one million units of penicillin administered orally. Cultures were taken daily until the absence of group A beta-hemolytic streptococci was demonstrated; then penicillin therapy was discontinued.

It soon became apparent that group A beta-hemolytic streptococcic infections occurred infrequently.[3] Eventually, therefore, the administration of penicillin was limited to those patients with clinically severe respiratory infections that might conceivably have been of streptococcic origin. It was recognized, however, that the different types of nasopharyngeal infections could not be differentiated clinically. The monthly antistreptolysin titer determination was found to be a fairly reliable index to the presence of recent streptococcic infections. In two cases, throat cultures sporadically positive for group A beta-hemolytic streptococci without clinical evidence of respiratory infection were followed by a rise in titer. In one of these patients increased activation of the rheumatic fever was observed.

COMMENT

It is now apparent, after three years of observation, that cortisone-corticotropin therapy of both early, acute rheumatic fever and chronic, active rheumatic fever does not necessarily stop the active process or prevent the development of permanent cardiac involvement.[4] The best therapy for the child with active rheumatic fever is, and probably will continue, for some time to be, a regimen of bed rest and guided mental and physical activity. Our experience over a 30 month period appears to indicate that the majority of children can be cared for medically in the home throughout the various cycles and manifestations of rheumatic fever. With children who do not have congestive heart failure, there is little necessity for either initial hospitalization or transfer to the hospital for further definitive care.

A breakdown of the reasons for the 10 hospital admissions of nine children in groups 1 and 2 reveals that three patients were hospitalized for additional diagnostic procedures (one unrelated to rheumatic fever), four for treatment of an aspect of rheumatic fever better handled in the hospital at the time (one patient was twice hospitalized for treatment of supraventricular tachycardia), and three for miscellaneous reasons related primarily to the home situation.

Thus, in only five instances in these first two groups was hospitalization necessary because the phase of illness could be better handled in the hospital than in the home. Only twice was it considered necessary to hospitalize patients for closer observation and investigation than could be carried on in the home. Two of these 10 admissions were primarily for cortisone therapy. With our present knowledge of the use of this drug and its side-effects, these two patients could now be treated just as well at home as in the hospital.

Children with chronic active rheumatic fever and congestive heart failure are unquestionably difficult to handle at home. The severity of the disease, the greater nursing burden imposed on the mother, the constant medical attention required, and the resistance of children to the salt-free diet are the elements of the problem. Unless the period of congestive failure is short or easily controllable with the usual regimen, hospitalization becomes necessary at some phase of the illness. In fact, in our opinion, unless the usual therapeutic measures quickly relieve the failure, corticotropin therapy should definitely be instituted. There is a good possibility of clearing the congestive failure, although the rheumatic activity will not necessarily disappear. In congestive failure, hospitalization is indicated for hormonal therapy rather than its institution in the home.

The feasibility of maintaining a prolonged bed rest regimen for children cared for in the home has been questioned. In our program this was never a problem once the criteria established for home and parental suitability were fulfilled, and because of the continued stimulus to creative effort furnished by the occupational therapist and to educational achievement by the home teacher. There was one exception—a child had to be hospitalized for institution of a more satisfactorily restricted regimen.

Current belief as to the therapeutic value of a bed rest regimen during the active phase of rheumatic fever is that, by this means, the duration of the morbid process is shortened, and the degree of residual cardiac damage

3. Young, D., and Rodstein, M.: Unpublished data.

4. Barnes, A. R., and others: Effect of Cortisone and Corticotropin (ACTH) on the Acute Phase of Rheumatic Fever: Further Observations, A. M. A. Am. J. Dis. Child. **82**: 397 (Oct.) 1951. Dorfman, A., and others: The Effect of Adrenocorticotrophic Hormone on Rheumatic Fever, Pediatrics **8**: 603, 1951. Kuttner, A. G., and others: Effect of ACTH and Cortisone on Rheumatic Carditis: Observations on Eighteen Cases, J. A. M. A. **148**: 628 (Feb. 23) 1952. Young, D., and Rodstein, M.: Results of Cortisone-Corticotropin Therapy in Chronic Active Rheumatic Fever, A. M. A. Arch. Int. Med. **90**: 64 (July) 1952.

is kept to a minimum. A statistical evaluation of over-all results in regard to the time required to achieve quiescence of rheumatic activity and the degree of residual heart damage in this group of patients obviously cannot be made. We have concluded, however, that the end-results in those cared for totally at home were more favorable than results in similar patients hospitalized for the entire period of their illness.

Having accepted the restricted regimen for an indefinite period, where has the child ill with rheumatic fever preferred to spend his period of illness—in the home or in the hospital? Almost all of the children in this study had one or more prolonged periods of hospitalization either immediately prior to transfer to the program or within the year before they were first seen by us. In our experience the child and the parents have invariably preferred the period of prolonged care at home to that in the hospital. This is at complete variance with the recent report by Bauer.[5]

The argument that the possibility of hemolytic streptococcic respiratory infection is greater for the rheumatic child cared for at home than for the child in the more sheltered environment of the hospital is no longer valid. Our bacteriological and serologic studies of this group of children revealed an extremely low incidence of such streptococcic infections and of noninfected carriers in comparison with earlier studies.[6] This low incidence and the expense and time involved make a continued bacteriological survey of all patients impractical. An equally effective and less costly method is the continued use of orally administered prophylactic penicillin in all patients cared for at home. The efficacy of this therapy has been well demonstrated.[7]

This was a pilot study purposely well provided with personnel and laboratory facilities, so that data on all aspects of caring for the sick child at home could be obtained. A home care rheumatic fever program could be effective with a much simpler structure and with a minimum of laboratory services and professional personnel. The routine oral use of penicillin prophylactically would eliminate the necessity for elaborate and time-consuming bacteriological and serologic studies. Several functions could be performed by the same person. Minimal requirements recommended for such a program are personnel including an internist or pediatrician, visiting nurse, and a psychiatric social worker and laboratory facilities for basic hematological and bacteriological studies and electrocardiography.

SUMMARY AND CONCLUSIONS

The organization, medical management, and results of a 30 month pilot project for the complete care in the home of the child ill with chronic active rheumatic fever are described. Clinical conditions and social problems requiring termination of care at home and hospitalization are described. Results indicate that when certain initial criteria for home suitability are met, most children with active rheumatic fever and free of congestive heart failure can be cared for as well at home as in the hospital, with an equally good end-result and with greater over-all advantage to the patient and his family.

Montefiore Hospital, Gun Hill Road (Dr. Young).

5. Bauer, I. L.: Attitudes of Children with Rheumatic Fever, J. Pediat. **40**: 796, 1952.

6. Hare, R.: The Classification of Haemolytic Streptococci from the Nose and Throat of Normal Human Beings by Means of Precipitin and Biochemical Tests, J. Path. & Bact. **41**: 499, 1935. Schwentker, F. F.: Survey of Hemolytic Streptococci in Certain Army Camps, Army M. Bull. **65**: 94, 1943.

7. Massell, B. F.: Present Status of Penicillin Prophylaxis of Rheumatic Fever, Mod. Concepts Cardiovas. Dis. **20**: 108, 1951.

PHILADELPHIA PLAN FOR HOME CARE OF CHRONICALLY ILL PERSONS

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A home care program differing in concept and method from others more generally known has been in operation in a section of Philadelphia since 1949, under the aegis of the Visiting Nurse Society of Philadelphia. This program, officially known as the Intensive Home Care Plan for the Chronically Ill, is based on medical care rendered by the family physician practicing in the community, in contrast to plans in which medical care is given by staff physicians of the hospital from which the patient has been discharged. The purpose of the plan is to give the chronically ill, home-bound patient better and more complete medical care in his own home, using the team cooperation approach and always keeping him under the direct supervision of his private physician. It was designed to permit the participating hospitals to use their beds to better advantage by the discharge of patients who no longer need specialized hospital care and who can, therefore, be sent home, provided the necessary equipment, personnel, and supervision are available. We believed that our plan would reduce the incidence of rehospitalization among patients referred to us by the participating hospitals. The plan was set up also to improve medical and social care of persons who have been home-bound for long periods, who may or may not have been previously hospitalized, and who probably sometimes feel deserted. We believe that our plan would reduce the number of initial hospitalizations among this group.

Many home care plans have been established under the direct supervision of the institution sponsoring them and have been considered to be extramural functions of those institutions. The patient remains under direct care of the hospital, and the private physician has no voice in the further management of the case. That all these plans have been successful has been fairly well established. The cost of the care of the patient at home by the hospital is generally stated to be about one-fourth the cost of caring for that patient in the hospital. The important considerations are that the patient continue to receive good care at home and that, thus, the number of hospital readmissions

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is reduced. Many patients who do poorly in the hospital do much better in their home surroundings, eating the food that suits their palate, seeing their friends at anytime, and being with their loved ones.

In our plan, in contrast to other plans, the patient must always remain under the direct supervision of his personal physician, whose orders we follow. Nothing is done without orders from the patient's physician. Patients may be referred by private physicians or hospitals. The hospitals must make certain that the referred patient has a physician responsible for him at home, either his own or one appointed by the institution. Patients requiring an appointed physician are usually those who have no private physician because they are unable to afford one. Since an adequate physician-patient relationship is a necessity for the success of our plan, it was decided early that, to maintain this important relationship, we would, when circumstances demanded, pay the physician's fees, using the Pennsylvania Department of Public Assistance fee schedules as a basis. Thus, our indigent patients would not have to worry about the "doctor bills," and physicians would not have to curtail medical supervision because of economic considerations.

Ideal home conditions do not enter the decision to accept a patient into our plan. Although we certainly prefer such conditions, many patients have been accepted whose home conditions were rather poor. The hospitals in the area have no direct voice in the administration of the plan. In addition to their arrangement for physicians to be responsible for their referred patients, they are asked to provide social appraisals of these patients. We proceed from that point. The hospitals are asked to provide necessary laboratory and x-ray services for all patients when these services are otherwise unobtainable, for which they are paid by the patient or by our plan. They also are asked to supply medical and surgical consultants on a clinic basis and to hospitalize and rehospitalize patients when necessary. It is most gratifying that all of the hospitals in the area are cooperating very well.

The plan provides the following services in the patient's home, always under the direction of the patient's own physician and under the supervision of a nurse coordinator, who is a member of the Visiting Nurse Society staff:

Part-time nursing service
Physiotherapy
Occupational therapy
Part time housekeeping service
Nutrition consultation
Mental hygiene consultation
Social service consultation through existing agencies
Laboratory service
X-ray service at hospital x-ray departments
Medical and surgical consultation service at hospital clinics
Transportation to and from hospitals and clinics
Speech therapy
Education consultation
Surgical appliances, such as braces, shoes, and corsets
Home medical equipment, such as beds, walkers, and bedpans
Medical supplies, such as bandages and medicine
Friendly visitors

Our permanent staff consists of a part-time medical director, a full-time coordinator, and a part-time secretary. Whenever possible we have used existing staffs for direct services; thus nursing services, physical therapy, and occupational therapy have been supplied by the two cooperating agencies, namely, the Visiting Nurse Society and the Starr Centre Association, while social case work is provided by the social service departments of the cooperating hospitals and the community social service agencies.

OPERATION OF THE PLAN

The physician in charge of the patient is asked to fill out a referral form giving the pertinent medical information about the patient and prescribing the treatment, such as nursing, administration of medicine, physiotherapy, occupational therapy if desired, and diet. This referral form is kept as simple as possible. After studying this information, the medical director of the plan visits the home to evaluate the situation and to become acquainted with the patient and his family. Meanwhile, the patient and the home have been visited by a nurse or the coordinator, who ascertains home conditions, explains the plan to the family and patient, determines what costs, if any, the family can bear, and decides what home equipment is needed and whether part-time housekeeping is required. Social service consultation follows if needed. A decision is then made by the coordinator and the medical director as to the acceptability of the patient, and the referring physician is called to inform him of the decision and to discuss any problems. We have not knowingly accepted psychiatric patients or patients with communicable diseases.

The physician is asked to give a monthly report on the patient's progress, indicating any change in treatment or diagnosis, making use of a simple form that is mailed to him with a self-addressed stamped return envelope. The physician in turn receives a monthly report of what has been done for the patient. The cooperation of the physicians has been good. The nurse in charge of the patient contacts the physician whenever an immediate problem arises. Periodically, problem patients are discussed at evaluation conferences, at which time all persons working with the patient are asked to be present. We have tried to have the physician in charge of the patient present at the conferences but so far have succeeded in getting only a few to come. We believe these conferences have a great potential value to all personnel involved at the postgraduate level of education. The physicians are especially benefited by learning the scope of ancillary medical services available to their patients. These conferences show to all the method and results of the team approach to the care of chronically ill persons.

RESULTS OF PROGRAM AND SERVICES RENDERED

After approval by the Philadelphia County Medical Society in March, 1949, the first patient was accepted in April. On July 31, 1952, after three and a fourth years of operation, 160 patients had been accepted; 84 were discharged, 36 died, and 40 are still being cared for. An analysis of the 84 patients who have been discharged reveals the following facts: 8 patients returned to school or work; 41 were able to resume most of their activities of daily living; 11 were discharged because their families were able to take over complete care guided by programs

set up by our plan; 5 were returned to the regular Visiting Nurse Service, since they required only one service and, therefore, did not need a coordinated program; 6 were discharged because they or their families were indifferent; 1 was discharged because his physician was indifferent toward our efforts. The last patient was discharged to the regular Visiting Nurse Service so that he would not be left without care.

An analysis of the sources of patient referrals showed that 42 patients were referred by local cooperating hospitals, and 118 were referred directly by private physicians. These latter 118 patients were referred by 90 physicians as follows: 69 physicians referred one patient each, 18 referred two patients each, 1 referred three patients, 1 referred four patients, and 1 referred six patients.

Many of the private physician referrals were stimulated by the alertness of the Visiting Nurse Society and Starr Centre Association nurses, who, on answering routine nursing calls, found chronically ill patients, many of them aged, who required coordinated home care. These nurses would then acquaint either our coordinator or our medical director with the problem; then one of our staff would explain our services to the physician and the family. Most of the physicians and families were convinced about the worth of the service and made application for care.It is gratifying to note that a certain number of physicians who were originally approached in this manner are now directly applying for aid for their chronically ill, home-bound patients.

The age distribution of the patients accepted as of July 31, 1952, is shown in the following tabulation:

Under 30	9 (5.6%)	
30-39	11 (6.9%)	
40-49	16 (10%)	
50-59	31 (19%)	
60-69	36 (22.5%)	58.1%
70-79	40 (25%)	
Over 80	17 (10.6%)	

Thus 93 (58.1%) of our patients were 60 years of age or older. The primary diagnoses among these 160 patients were as follows: cerebral vascular accidents 48, malignant disease 24, circulatory system diseases 19, arthritis 20, fractures 20, nervous system diseases 14, diabetes 9, bone diseases 2, nonmalignant tumors 2, and muscular dystrophies 2.

The services rendered and the number of patients receiving the services were as follows: nursing service 133, physiotherapy 116, occupational therapy 101, part-time housekeeping 41, nutrition consultation 22, mental hygiene consultation 40, social service consultation 75, x-ray service 4, laboratory service 4, medical consultation at hospital clinics 7, transportation to and from hospitals and clinics 8, speech therapy 7, education consultation 5, surgical appliances, such as braces, shoes, and corsets, 17, medical supplies, such as bandages and medicine, 4, medical equipment, such as beds, walkers, and bedpans, 16, friendly visitors, 11, and physician's bills paid by the plan to a total amount of $100, 4. The total number of visits made to all patients in the rendering of the various services was as follows: plan coordinator's visits 332; personal physicians' visits 1,503; clinic visits 47; medical director's visits 214; nursing visits 4,546; physical therapy visits 2,664; occupational therapy visits 1,209; speech therapy visits 170; nutrition conferences 17; mental hygiene conferences 32; miscellaneous conferences, including social service conferences, 196. No accurate data on the amount of housekeeping done is available, since many patients made their own arrangements with housekeepers whom we suggested. Fifteen patients were readmitted to the hospital while receiving care under the plan.

As stated, our current case load is 40 patients; our maximum has been 43. The total number of patient days spent has been 29,443. The experience in this plan seems to follow the general experience in the Visiting Nurse Society in that about 50% of the nursing, physical therapy, and occupational therapy service is fully paid for by the patient. The plan has cost the community about $2.60 per patient day. This cost per patient day was computed without deducting fees paid by patients who were financially able to pay them for nursing care, physical therapy, occupational therapy, and other services.

COMMENT

The cooperating hospitals have responded favorably to this plan, even though more referrals from them would be desirable. These hospitals are the Germantown Hospital, Chestnut Hill Hospital, the Hospital of the Woman's Medical College of Pennsylvania, Albert Einstein Medical Center (North), and the Memorial Hospital of Roxborough. Germantown Hospital has estimated that the plan saved the hospital about 500 hospital patient days from April 1, 1949, to Jan. 24, 1951. The number of referrals from the hospitals varies directly with their awareness of the plan and the interest of their social service departments.

Sometimes the hospitals have delayed in referring patients because of delay in finding a physician who would assume responsibility for the patient. This has not proved to be too great a problem. One hospital has solved it by supporting by a fellowship a part-time physician who is responsible for indigent home-bound cancer patients who have no private physician. Since this physician is acting as the patient's private physician, our requirement that each patient have his own physician is fulfilled. The hospitals have expressed disappointment in being unable to refer patients whose residence is outside the boundaries set up for the plan. In the not too distant future, this problem will be partly solved by extension of our geographical boundaries.

Most of the physicians have been enthusiastic about our plan. Several were dubious at first, and a few turned down the plan, claiming that nothing could be done for their patients or that they did not wish to put their patients to the added expense. Some of these physicians were persuaded to try the plan after being informed that they would have absolute control of the patient and that the matter of expense would not enter into our decision to admit the patient to our plan. These same physicians

soon discovered that we made it possible for them to care for their patients more adequately and with much less effort on their part.

How has this plan affected the interest of the physician in his patient? Does it increase or decrease? Unquestionably, I believe it increases in most instances. The physician becomes more cognizant of the beneficial effects on his patient of the cooperation of a team of workers in the patient's care. This team of workers must include the physician as the keystone of the group. He soon realizes this and before long, either consciously or otherwise, is himself taking greater interest in his patient. Thus, I believe the plan has been a driving force in educating the private physician to the potentialities of teamwork in home care.

The nurses and other workers in the plan have benefited, too. Their interest and efficiency in caring for these patients have increased tremendously. This, I believe, and our staff agrees, is due to the team approach of caring for chronically ill patients. We believe that the total amount of nursing services for many patients has been cut down as compared to the amount required by similar patients under the care of the Visiting Nurse Society before the Intensive Home Care Plan was started. Many hemiplegic patients who received custodial care at home instead of coordinated care had to be visited by nurses for longer periods than those receiving care under the Intensive Home Care Plan. The latter patients were able to be cared for by their families or by themselves sooner than the former patients.

What has been the reaction of the patients and their families? Almost all hospitalized patients want to return home as soon as possible, and they are most grateful when they can get home sooner than would otherwise be possible. Many patients who are sullen and rebellious in the hospital become happy and cooperative at home. Many patients who have been home for a long time, bedfast or partially helpless, feel they are being forgotten and have nothing to look forward to. These patients, I believe, have received a tremendous benefit and uplift as a result of our plan. This benefit cannot be measured in units, but all our staff agree that it is real and worth while. The fact that persons come in to give them care and that these persons show interest in them and teach them something raises them from despondency. The well members of the families also find a new lease on life. Whereas before they did not know where to get help, they now receive support from our plan in housekeeping, advice and knowledge of how to handle and care for the patient. Above all, when they see the sick one a little more contented and pleased, they also feel pleased. At first, some families were anxious to place their patients in nursing homes or similar institutions. After interviewing these families, it was realized that they actually were afraid to keep the patients home, because they did not know how to take care of them. With education and advice and having some extra equipment in the home, some families were soon happy to keep their sick member at home.

SUMMARY AND CONCLUSIONS

The experiment described was developed in response to organized community demand to determine whether medical and supportive services for chronically ill patients in their own homes and under the care of their own visiting physicians, when developed in a coordinated manner, would lead to maximum improvement physically, emotionally, or socially, at less expense than that of hospital or institutional care. Under this program, in operation for three and one-quarter years in one section of a large eastern city, 160 patients have been cared for. Services have been offered on a visiting basis at a frequency determined by the individual need and have been coordinated by a community public health nursing association. The team approach has been used throughout, with careful admission review and regular progress conferences. Referrals have come from all hospitals and a large number of private physicians in the area. Review of the progress made by patients with a wide variety of conditions and observation of the favorable changes in family life suggest this program as one approach to the problem of care for persons with chronic illness who wish to remain at home. In our experience, those who display readiness to cooperate in intensive care show improvement physically, emotionally, or socially in situations formerly believed static or hopeless. Consideration of the organization pattern, the interagency, physician-agency, and physician-patient relationships, and the expenses involved in promotion and operation lead to the conclusion that such a plan can be repeated in a wide variety of communities.

4540 Cottman Ave. (35).

Trial Forceps.—Midpelvic arrest may be due to a variety of causes, bony disproportion being only one, and . . . many of these are correctable, after which vaginal delivery is easy and safe. Therefore it would be poor obstetrics indeed to say that every patient with midpelvic arrest must be delivered abdominally or that all must be delivered from below. From the literature and from personal conversation and communication it is quite apparent that many outstanding obstetricians are practicing "trial forceps" today. . . . This study has convinced us that the midforceps operation, when always carried to conclusion, may be a very dangerous one for the infant, ranking second only to internal podalic version and breech extraction. On the other hand, many of these cases of midpelvic arrest may be capable of successful delivery with gentle traction and with a minimum of risk. If these gentle efforts fail, all attempts at vaginal delivery should be discontinued and resort had to the abdominal route. This does not appear to increase the risk to the mother while it is definitely less hazardous for the baby. It is true that the section rate may be slightly increased in theory, but it is doubtful if this will prove true in actual practice, for a certain number of patients delivered abdominally without trial forceps would be found to have easy vaginal deliveries when the attempt is made.

It should be emphasized that "trial forceps" is a method of delivery which should be undertaken only by a skilled obstetrician, and not by the general practitioner who has had no specialty training. This is also true of many obstetrical operations, not the least of which is a midforceps delivery itself. It is felt that this fact should not prevent its recommendation or its use.—L. H. Douglass, M.D., and D. F. Kaltreider, M.D., Trial Forceps, *American Journal of Obstetrics and Gynecology*, April, 1953.

REDUCTION IN OPERATIVE MORTALITY IN THE VERY AGED

Sidney E. Ziffren, M.D., Iowa City

Most physicians are aware of the tremendous rise in the number of aged persons in our population, but few are aware of the magnitude of that increase. Since the first part of the 20th century the number of persons 65 years of age and older in the United States has quadrupled, while the general population has only doubled. There are 12,269,537 men and women 65 years of age and over in our population today. Of this number it has been estimated that 1,670,000 or approximately 13.6% of this age group are 80 years of age and over. The improvement in life expectancy has been greatest at birth and decreases markedly thereafter, so that today the actual life span at the age of 80 is not much longer than it was in 1900. More persons survive to an older age than before, but, having reached this age, they do not survive longer than did the aged in 1900. For instance, in 1900 the life expectancy at the age of 80 was 5.1 years. At present it is 5.4 years. On the basis of a projection from census figures it is estimated that in 1960 there will be about 15,570,000 persons in the age group of 65 years and over, and approximately 13.8% of this group, an estimated 2,175,000 persons,[1] will be 80 years of age and over. Even with this outlook, however, the complete expectation of life of the white male, as extracted from the United States life and actuarial tables of 1939 to 1941,[2] is a remarkable number of years if he reaches extreme old age (fig. 1). This is the average number of years lived after a specified age if the person survives to that age. A person who survives to the age of 80 will have a life expectancy of 5.44 years, which falls to 4.11 years at the age of 85, to 3.17 years at the age of 90, and to 2.52 years at the age of 95.

In consideration of these facts, therefore, necessary surgery should not be withheld from elderly persons because of old age. It is the purpose of this paper to show that age per se is not a contraindication to necessary surgery. A review of the patients 80 years old and over who were treated surgically at the University Hospitals of the State University of Iowa during the 10 year period, 1942 to 1951 inclusive, forms a major portion of this report. These patients were cared for on the general surgery service exclusively; auxiliary services such as urology and orthopedics are not included.

STATISTICAL RESULTS OF SURGERY

In this series there were 429 patients, 16 of whom were 90 years of age or over. The age distribution was as follows: 80 to 84 years, 306 patients; 85 to 90 years, 107 patients, 90 years and over, 16 patients. There were 265 men and 164 women. A total of 478 operations were performed on this group, with an over-all mortality of 65 deaths (15.1%). If the mortality is calculated on the total number of operative procedures performed rather than upon the number of patients, the mortality is 13.5%. Forty-one patients had multiple operations, and in this group there were only four deaths, a mortality rate of 9.7%. The commonest causes of death were bronchopneumonia, pulmonary embolus, cardiac failure, metastatic carcinoma, and peritonitis. In practically all instances general anesthesia was given, sometimes supplemented with local anesthesia. In only a few instances was spinal anesthesia used. A wide variety of surgical procedures were performed on the group. The marked increase in the number of patients 80 years old or over during this 10 year period is evident in figure 2. In 1942 only 15 patients were admitted for operative procedures at the age of 80 or over, and in 1951 79 patients were admitted. It is interesting to note that the surgical procedures performed in 1951 were of far greater magnitude than those performed in 1942 and included neck dissection, bowel resections, gastric resections, and radical mastectomies. The decrease in the mortality rate is also apparent. In 1942 it was 13.3%; in 1943, 18.6%; in 1944, 30.0%; in 1945, 35.8%; in 1946, 16.6%; in 1947, 13.8%; in 1948, 15.3%; in 1949, 6.5%; in 1950, 7.4%, and in 1951, 11.3%. In 1951 two patients with generalized peritonitis from perforation of the colon proximal to a malignant lesion with obstruction were operated on as a last resort. The chances of recovery were very slight because of the nature and duration of the peritonitis. If these two patients had not been operated on, the mortality rate in 1951 would have been 8.8%. The surgery was performed by both surgical residents and staff physicians. It is evident from this series that operative techniques had very little influence on the reduction in operative mortality. The most important factors were preoperative and postoperative care and the availability of antibiotic drugs.

PREOPERATIVE AND POSTOPERATIVE CARE

If there is no emergency, time must be taken to ensure that the blood volume and protein reserves of the patient are adequate and that he is properly hydrated. It is easy to be misled by a presumably normal hemoglobin level and red blood cell count in the elderly patient; this may lead to a false sense of security. It has been demonstrated that practically all elderly surgical patients have a significant deficiency in blood volume.[3] The possibility of shock during surgery is very much greater in the aged person with a low blood volume. If any major surgical procedure is contemplated, transfusions must be considered a necessary part of the preoperative preparation of the patient.

The elderly patient is very likely to have nutritional deficiencies, especially if he has a condition requiring surgery. Consequently, a nutritious diet, rich in protein,

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Read at the Sixth Clinical Session of the American Medical Association, Denver, Dec. 3, 1952.

Because of lack of space, one table has been omitted from THE JOURNAL and will appear in the author's reprints.

1. Dublin, L. I.: Metropolitan Life Insurance Company: Personal communication to the author.

2. Greville, T. N. E.: United States Life Tables and Actuarial Tables, 1939-1941, Department of Commerce, Bureau of the Census, 1946.

3. Bosch, D. T.; Islami, A.; Tan, C. T. C., and Beling, C. A.: The Elderly Surgical Patient: An Analysis of 500 Consecutive Cases of Patients 60 Years of Age or Older, A. M. A. Arch. Surg. **64**: 269-277 (March) 1952.

must be provided and often must be individualized to encourage the patient to eat. It is supplemented with vitamins given orally and sometimes, parenterally. The patient is often provided with whiskey to increase his appetite; if he still does not have an adequate food intake, a supplementary formula feeding of high protein and caloric value is given. The simple formula used is 30 gm. of skim milk powder (approximately 3 full tablespoons) dissolved in a glass of skim milk. This provides 18 gm. of protein and 26 gm. of carbohydrate. The mixture is

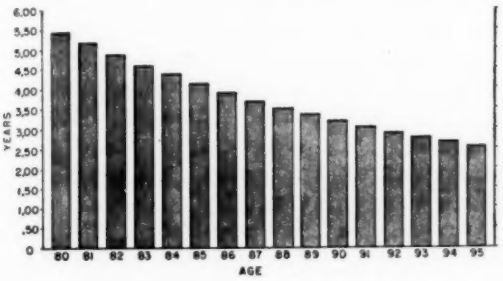

Fig. 1.—Life expectancy of persons 80 to 95 years old among the general population.

flavored with chocolate or vanilla and is well mixed in a food blender or beater. If the patient does not take the formula feedings voluntarily, an indwelling polyethylene gastric tube is used. The improvement in the mental attitude of many patients after several days of adequate nutrition is often remarkable.

In some instances it is impossible to feed the patient by mouth, which, of course, is the most suitable method of providing the nutritional requirements. Parenteral feedings by the intravenous route can be used, but the fluid must be administered slowly to avoid overloading of the circulation. The water requirement can be easily met, and a major portion of the caloric needs can be supplied by use of the protein hydrolysates. Alcohol is usually added to these solutions to provide additional calories. The loss of the patient's protein reserve can be reduced to a minimum in this fashion. Subcutaneous feedings also may be utilized. The use of hypodermoclysis may be dangerous, however, especially in a patient who is suffering from dehydration, salt deficiency, or shock.[4] Ordinarily, the subfascial injection of isotonic saline is safe, but injection of a solution without electrolytes, such as 5% glucose in water, or of hypertonic solutions without inorganic electrolytes may cause oliguria, anuria, or circulatory collapse. The latter two types of fluid must first come into equilibrium with the plasma to be absorbed, and thus, withdraw fluid from the plasma and interstitial fluid compartments. In the aged this is especially dangerous, because the physiological reserve is low. The use of hyaluronidase, which causes the solution to diffuse over a greater area, and thus possibly increases the amount injected, might very well intensify this dangerous reaction. The intravenous route seems to be the safest means of parenteral fluid introduction.

The one factor that has considerably reduced the mortality in these elderly patients has been the marked restriction of salt and fluids administered parenterally. This restriction was inaugurated in 1949 after results of surgery in this age group were reviewed.[5] A marked fall in the mortality rate resulted. The maximal amount of salt permitted daily is 5 gm. unless replacement of a definite sodium chloride loss is necessary. It has been found that if salt and fluid are not restricted, edema may develop rapidly and unexpectedly; this may result in a markedly increased susceptibility of the patient to pulmonary and cardiac complications. In addition, it has been noted that patients in this age group rarely require more than 1,800 ml. of fluid a day. The intravenous administration of more than 2,000 ml. daily may prove extremely hazardous unless the patient is definitely dehydrated. It is likely that the very elderly person has a much lower metabolism and eliminates much less waste in his urine than does a younger person and, consequently, requires much less fluid daily.

The patient is not permitted to remain recumbent constantly. He is urged to go to the bathroom and to walk about the ward freely. The cardiac and kidney status must be evaluated, and, if necessary, digitalization is accomplished. If azotemia is present, it should be treated prior to surgery.

Even in an acute emergency, time must be taken to overcome dehydration and shock preoperatively, because the aged patient is much more susceptible to blood volume loss from dehydration and shock than is a younger person. His vasomotor system is far less capable of compensating, and the heart is unable to increase its rate and output. If this is not done it can be expected that the patient will die on the operating table or shortly thereafter. If the patient is severely dehydrated a relatively rapid rate of fluid administration by intravenous means is not harmful, because this fluid will be utilized rapidly. As a general rule the first 1,500 ml. of fluid can be introduced at the same rate that would be used for a younger person. After that quantity has been administered the patient usually begins to excrete urine, and the rate of intravenous flow can then be adjusted not to exceed 500 ml. an hour.

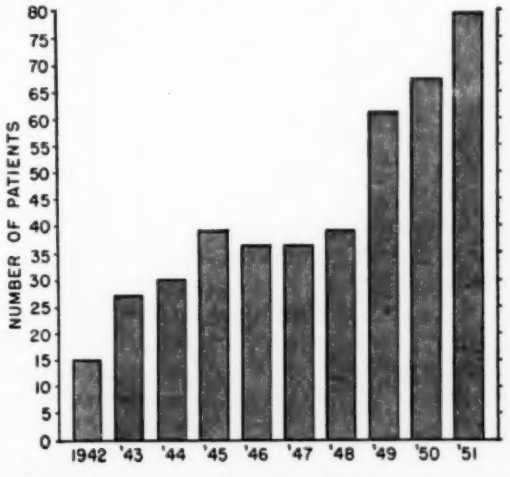

Fig. 2.—Increase in number of surgical patients 80 years old and over in the series reported from 1942 to 1951 inclusive.

There is no single ideal anesthetic agent, either general or local, for the aged patient. The same fundamentals that govern the choice of anesthetic agent in the young apply to the aged. The agent chosen should provide the

4. Abbott, W. E., and others: The Danger of Administering Parenteral Fluids by Hypodermoclysis, Surgery 32: 305-315 (Aug.) 1952.

5. Ziffren, S. E.; Zager, L. L., and Cullen, S. C.: Hazards of Surgery Beyond the Age of Eighty, Geriatrics 5: 252-258 (Sept.-Oct.) 1950.

desired depth of anesthesia with minimal derangement of the physiological processes of the patient. Wide swings in the depth of anesthesia and prolonged deep anesthesia should not be permitted. At all costs abnormally low blood pressure must be avoided; less concern is felt about abnormally high pressures. The oxygenation of the heart and cerebrum is of paramount importance.

During the postoperative period every effort must be made to have these patients out of bed and in a chair on the day of operation and several times daily thereafter. They must be turned frequently and given a minimum of sedation. Morphine or meperidine (Demerol) hydrochloride in small quantities may be used for severe pain, but it is not too unusual to see wide hallucinatory side-effects such as are commonly seen with the barbiturates, even when the drugs are given in very small quantities. Intercostal nerve block instead of analgesic drugs for relief of upper abdominal or thoracic pain often proves very satisfactory.

If a Levin tube is used in the stomach for gastric suction it should be removed as soon as possible. The tube inhibits coughing, increases the amount of mucous secretion, which may lead to atelectasis and subsequent pneumonia, and not infrequently produces ulceration of the pharynx and esophagus, which interferes with the early resumption of oral feeding. An even greater problem produced by the tube is an upset of electrolyte balance, which may be difficult to control; over a prolonged period the loss of potassium may in turn lead to a vicious circle of prolongation of the intestinal ileus for which the gastric suction was primarily used. It is not unusual, however, to find that resumption of normal peristalsis in the aged after an abdominal operation is very slow or, if it does resume early, that the peristalsis is only segmental, and the abdomen becomes distended on withdrawal of the Levin tube. This condition is often incorrectly diagnosed as a mechanical intestinal obstruction. Actually, the patient has not regained bowel tone throughout the intestinal tract, but only in segments of bowel. Within a short time peristalsis returns to normal.

Oral feeding is encouraged as soon as possible, and again, every effort is made to keep the parenteral salt intake at a minimum to prevent edema and its inevitable fatal complications. If the patient has required constant gastric suction for a prolonged period, the possibility of potassium deficiency must be considered. Parenteral administration of potassium can be used in the extremely aged only if the patient is excreting an adequate quantity of urine. Heart block due to myocardial disease is always a possibility in the aged and should be considered prior to the parenteral administration of potassium. In such cases the fluid containing the potassium must be administered very slowly. If the patient can take fluids by mouth, potassium deficit is no problem, inasmuch as it is easily corrected by an ordinary diet rich in bouillon broth and fresh fruit juice.

Hypotension, with its dangers of thrombosis and irreversible shock, is avoided at all costs. This necessarily requires frequent checks on blood pressure and pulse rate during the immediate postoperative period. Penicillin is given routinely to prevent infective pulmonary complications. It is well to remember, however, that pulmonary complications ordinarily are preceded by edema, which can usually be prevented by restricting the salt intake and by not overloading the circulation with large quantities of intravenous fluids.

COMMENT

From the results obtained in this series it appears that necessary operative procedures should not be withheld from patients in the advanced age group. If reasonable attention is given to details, good results can be expected. In consideration of the fact that a person 80 years old has almost 6 years of life expectancy and at 90 has over 3 years, every effort must be made to treat patients in this extreme age group; they should not be permitted to die simply because they are believed to be too old to withstand surgery. The fall in mortality rate in the series, from a high of 35.8% to the astonishingly low figure of approximately 11% within a short span of 6 years, demonstrates what can be accomplished in the management of these elderly persons.

This, however, should not permit us to grow careless in the handling of the aged surgical patient. Elective surgery should be undertaken only with the greatest hesitation. Postponement of surgery until the patient is in optimal condition, especially from the standpoint of blood volume and nutrition, is important, and avoidance of circulatory embarrassment through overloading with salt and water must be kept constantly in mind. The staging of operations must also be considered, for, as demonstrated in the mortality statistics, repeated small procedures are better tolerated by very feeble persons than is one large procedure. The use of antibiotics has undoubtedly contributed to a lowering of the operative mortality, but not overwhelmingly, for the drugs were used during practically the entire period of this study.

SUMMARY

Surgical procedures carried out on patients 80 years of age and over during a 10 year period, 1942 to 1951, inclusive, have been reviewed. The over-all mortality was 15.1%. During the years studied, in spite of a more than fivefold increase in the number of surgical procedures performed, the mortality rate has dropped to 11.3%. Age alone is not a contraindication to necessary surgery. The factors contributing chiefly to the lowering of the mortality rate are the preoperative preparation and postoperative care of the patient in regard to nutrition, blood volume, salt and water intake, and the use of the antibiotics.

Adenocarcinoma of the Uterine Corpus.—In our series, carcinoma of the corpus constituted 32.2% of uterine malignancy and 23.4% of total female reproductive tract malignancy. Carcinoma of the corpus is primarily a disease of the early postmenopausal period, although 20 to 30% of the cases occur before the menopause. Seventy-five per cent of the cases occur after the age of 50. The highest incidence of carcinoma of the corpus occurs in the sixth decade. The average age varies from 50 to 58 years. Age is a distinct factor in the ratio of carcinoma of the corpus to carcinoma of the cervix, and the relatively increased incidence of corpus carcinoma cited above may be associated with the aging of our population. Under 35 years of age, corpus carcinoma constitutes 3% of uterine malignancy. This ratio gradually increases with age. In the sixth decade approximately 37% of uterine cancer is due to corpus carcinoma and in the seventh decade this ratio increases to 44%.—C. P. McCartney, M.D., Adenocarcinoma of the Uterine Corpus, *Surgical Clinics of North America*, February, 1953.

BRONCHOSTENOSIS COMPLICATING ASTHMA

Thomas W. Mears, M.D., Louis E. Prickman, M.D.
and
Herman J. Moersch, M.D., Rochester, Minn.

Benign nontuberculous bronchostenosis is a complication of either intrinsic or extrinsic asthma that too often is unrecognized. By bronchostenosis is meant a definite stricture-like narrowing of a bronchus that is considered to be inflammatory in nature and not the result of allergic edema or spasm. In 1939, two of us (L. E. P. and H. J. M.)[1] described the symptoms, physical findings, and the laboratory information that characterize bronchostenosis in asthma, and, in 1940,[2] we reviewed our experience at the Mayo Clinic with 140 patients with asthma who had been especially selected for bronchoscopic examination. Of this series, 60 patients were found to have definite stenosis of one or more bronchi. Subsequently, others [3] have reported their experiences with this complication of asthma.

Recently we reviewed the records of 1,034 consecutive asthmatic patients who underwent bronchoscopic examination during the decade ending in 1950. Of these, 327 were found to have stenosis of one of more bronchi. There were 182 female and 145 male patients in this series. All age groups were represented, the youngest patient being 3 years of age and the oldest 74 (fig. 1). The largest number of cases in any decade of life were found in the age group 40 to 49 years inclusive; however, in the decades preceding and following this one many cases were seen.

SYMPTOMS

The syndrome of bronchostenosis complicating asthma is a rather definite one and will be reviewed in some detail. The most prominent symptom is cough, which is usually persistent and at times paroxysmal. This, of course, aggravates the patient's asthma. The cough is usually productive of sputum, which varies in amount and character. During the period when a bronchus is stenosed, there is retention of secretions distal to the point of obstruction of the bronchus, and sputum may be absent or scanty. A localized obstructive pneumonitis develops and persists until this site is drained, either spontaneously or by bronchoscopic dilatation and aspiration of the retained secretions. Such secretions are mucopurulent, and after bronchoscopy they may drain in considerable quantity. Thus, it is not unusual for the cough to be nonproductive during an episode of bronchostenosis. The paroxysms of coughing are the patient's involuntary effort to overcome the stenosis and raise the retained secretions.

The second commonest symptom noted in our patients was fever, and the fever was occasionally accompanied by chills. Fifty-nine per cent of the patients gave a history of fever with their attacks. The fever was usually moderate and lasted from a few to many days. Often, as the febrile episode subsided, the cough became productive of increasing amounts of yellow or greenish sputum. The fever may be explained as resulting from the retention of secretions and from the inflammatory reaction in the adjacent lung. Fever was usually accompanied by leukocytosis.

Hemoptysis was noted in 35% of the patients reviewed and is an important symptom. Hemoptysis does not occur in uncomplicated asthma, and the source or cause must always be searched for. Bronchoscopy should always be carried out if no obvious cause for hemoptysis is found. The source of the blood-tinged sputum in bronchostenosis is thought to be the site of inflammation of the bronchus distal to the site of stenosis. A good rule to remember is that uncomplicated asthma is not associated with fever, purulent sputum, or hemoptysis.

Also worthy of note is the fact that 50% of the patients in this series gave a history of an infection of the upper respiratory tract preceding the attack. This was usually described by the patient as a "cold." A history of one or more episodes of pneumonia was obtained in 43% of the patients. A positive history of pleurisy on the affected side was obtained in 32%. Bronchostenosis is often mistaken for pneumonia because of the severity of the cough, the fever, blood-tinged sputum, physical findings, and roentgenologic evidence of localized pneumonitis or atelectasis. Many patients had a history of repeated febrile attacks that were described as "flu." It should be axiomatic, therefore, that a patient who has asthma and experiences one attack or repeated attacks of pneumonia, pleurisy, or influenza certainly must be suspected of having had bronchostenosis until the nature of the illness is proved otherwise. This is true of children as well as of adults.

PHYSICAL FINDINGS

The physical examination of persons having asthma complicated by bronchostenosis may disclose no abnormal findings other than the usual asthmatic rales; however, additional abnormal findings were present in 39% of the patients in our series. When a large bronchus is obstructed, either emphysema (ball-valve action) or, more often, obstructive pneumonitis occurs in that portion of the lung distal to the point of obstruction.[4] It should be emphasized that any obstructive bronchial lesion, for example, a foreign body or malignant growth, may produce asthma-like wheezing and dyspnea. This is an important consideration in the differential diagnosis of asthma, recalling the aphorism of Jackson that "all is not asthma that wheezes."

It is evident, therefore, that the physical findings in cases of bronchostenosis will vary. If abnormal findings are encountered, they will usually be those of obstructive

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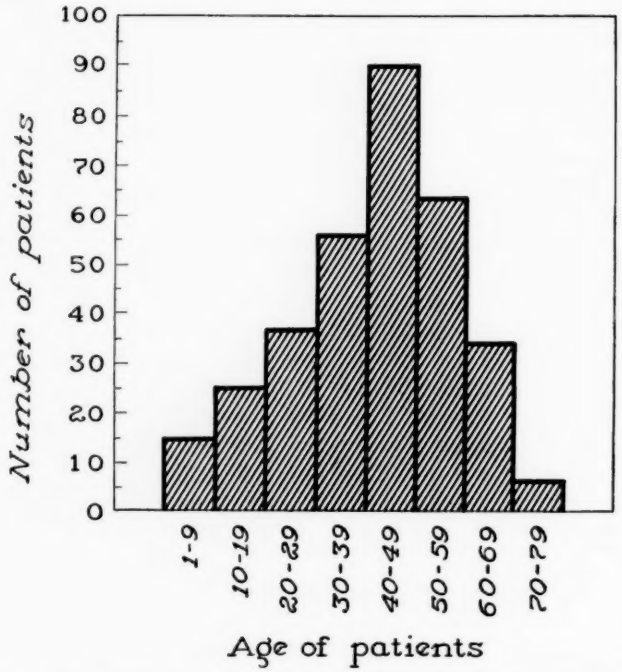
Read at the Sixth Clinical Session of the American Medical Association, Denver, Dec. 3, 1952.

Fellow in Surgery, Mayo Foundation (Dr. Mears), and from the Division of Medicine, Mayo Clinic (Drs. Prickman and Moersch).

1. Prickman, L. E., and Moersch, H. J.: Asthma and Its Association With Bronchostenosis, M. Clin. North America **23**: 961-975 (July) 1939.
2. Prickman, L. E., and Moersch, H. J.: Bronchostenosis Complicating Allergic and Infectious Asthma, Ann. Int. Med. **14**: 387-392 (Sept.) 1940.
3. (*a*) Mansmann, J. A., and Osmond, L. H.: Complications of Bronchial Asthma and Their Association With Bronchostenosis, Pennsylvania M. J. **49**: 513-517 (Feb.) 1946. (*b*) Waldbott, G. L.: Use and Abuse of Bronchoscopy in Allergic Asthma, J. Thoracic Surg. **18**: 526-531 (Aug.) 1949. (*c*) Waldbott, G. L.: Bronchoscopic Therapy in Allergic Asthma, J. Allergy **20**: 335-343 (Sept.) 1949. (*d*) Derbes, V. J.; Weaver, N. K., and Cotton, A. L.: Complications of Bronchial Asthma, Am. J. M. Sc. **222**: 88-108 (July) 1951.
4. Schmidt, H. W.: Benign Nontuberculous Bronchial Stenosis, Arch. Otolaryng. **39**: 43-52 (Jan.) 1944.

pneumonitis. The breath sounds in such cases are suppressed, and tactile fremitus is also suppressed over the affected site. Less frequently, there may be dullness to percussion over the affected part and a respiratory lag, with diminished excursion of the thorax, on the affected side. Careful and repeated examination of the asthmatic



Flg. 1.—Distribution of patients with bronchostenosis complicating asthma, according to age.

thorax should be made, because there will often be definite if not pronounced differences in the physical findings between the involved region in one lung and the corresponding uninvolved region in the opposite lung. Reexamination of the thorax after the patient coughs as well as reexamination on a subsequent day is important, because the occlusive signs may be due to a plug of mucus or a bronchial cast that is temporarily blocking a bronchus, in which case, on subsequent examination, these signs may have entirely disappeared. The presence of persistent and unilateral abnormal physical findings are of utmost importance, because in uncomplicated asthma the physical findings are similar in the two lungs. These positive findings will usually be present over the posterior part of the lower lobes; however, in five patients in our series, the obstruction proved to be in a bronchus of an upper lobe.

ROENTGENOLOGIC EVIDENCE

Because of the low incidence of positive roentgenologic evidence in the cases reviewed, we place more emphasis on the history and physical findings. In only 30% of the cases were the thoracic roentgenograms of some value in making the diagnosis of bronchostenosis. Several factors contribute to the high incidence of negative roentgenologic findings. Bronchostenosis may not have been present long enough in many instances to have produced changes visible in stereoscopic roentgenograms. In other cases, the lesion may be situated behind the cardiac shadow in the routine posteroanterior view of the thorax, and in other instances the presence of long-standing bronchitis results in rather dense peribronchial shadows, which may obstruct the fainter roentgenologic signs of obstructive pneumonitis.

When roentgenologic evidence of bronchostenosis is found, it is usually suggestive of atelectasis or, less frequently, bronchiectasis. In the case of the latter, the clinician should not confuse the syndrome of bronchostenosis complicating asthma with true bronchiectasis. Waldbott [3b] also made this observation during his experience with this complication of asthma. Lemon and coworkers [5] described the roentgenologic appearance of atelectasis as a "gauze-like shadow which extends more or less fan-like from the hilum toward the periphery of the lung and is of such slight density that the bronchovascular markings can be seen through it. Often an elevation of the corresponding arch of the diaphragm is associated with it and the heart and mediastinal structures may be displaced toward the affected side." This has been repeatedly confirmed in our cases of bronchostenosis complicating asthma.

BRONCHOSCOPIC OBSERVATIONS

The commonest indication for bronchoscopic examination in patients with asthma is the need of confirming or excluding the diagnosis of bronchostenosis. When the history and the results of physical examination and roentgenologic examination suggest the possibility of a complicating bronchostenosis, the patient should have the benefit of bronchoscopic examination. The only clinical means available for determining whether benign bron-

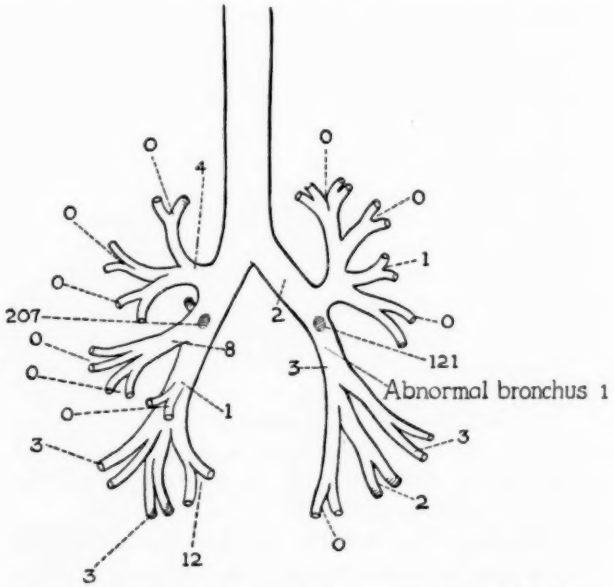


Fig. 2.—Diagram of the bronchi, showing the incidence and location of bronchostenosis in 327 patients.

chostenosis exists is direct observation by means of the bronchoscope. Should a stenosed bronchus be visualized, it can be dilated immediately and the retained secretions aspirated. Dilatation and aspiration alone will usually give prompt relief. When an experienced bronchoscopist is available, it is better to examine the bronchi in a suspected case and fail to find stenosis than to overlook a

5. Lemon, W. S.; Vinson, P. P.; Moersch, H. J., and Kirklin, B. R.: Primary Carcinoma of the Bronchus, Southwestern Med. **16**: 485-493 (Dec.) 1932.

stenosed bronchus that is present and thereby subject the patient to continued and persistent cough that will invariably aggravate asthma.

Bronchoscopy in such patients will reveal the usual findings of asthmatic bronchitis and, if stenosis is present at the time of bronchoscopy, a purulent secretion may be seen oozing from the narrowed lumen of the stenosed bronchus. When the stricture is dilated by means of dilating forceps, varying amounts of retained mucopurulent or purulent secretions will be found and can be aspirated. It may also be noted that the stenosed bronchus bleeds more readily when touched than does a normal bronchus.

In our series, the incidence of bronchostenosis was far higher in the right lung than in the left and, as has been previously stated, the superior division of the lower lobe is most frequently the portion involved (see the table and fig. 2).

There undoubtedly are many cases in which bronchostenosis complicating asthma clears up spontaneously. Perhaps the recent frequent use of antibiotics in the treatment of the acute febrile complications of asthma has prophylactic or therapeutic value in such instances. If so, this complication will be encountered less often in the future.

Bronchostenosis may not be seen in patients who undergo bronchoscopy during an interval when they have no symptom or other evidence of stenosis, even though the history suggests previous bronchostenosis. In such cases, there usually are increased secretions and other findings encountered in cases of chronic bronchitis. In other instances, some degree of stenosis persists even after the febrile episode subsides. The presence of this stenosis aggravates the patient's cough and asthma and may lead to subsequent febrile episodes.

At times more than one stenosed bronchus may be encountered, and in these cases the stenoses may be found on one side, or they may occur on both sides of the bronchial tree. We have noted that recurrences may take place in the same bronchus, in another bronchus of the same lung, or in the other lung. At the time of bronchoscopy in patients in whom a new site is involved, the site of the original stenosis may be entirely clear. Since bronchostenosis in asthma follows respiratory infections, the prevention of recurrences seems to depend on the success of the physician in having the patient avoid or in properly treating the early stages of infections of the respiratory tract. The advice given these patients at the Mayo Clinic is (1) to avoid persons who have colds or to keep a handkerchief or surgical mask over the nose and mouth if it is necessary to come in close contact with a person who has a cold, (2) to keep warm and dry and get plenty of rest, and (3) if a cold is caught, to go to bed at once until the acute episode has passed.

COMPLICATIONS OF BRONCHOSCOPY

Bronchoscopic examination in the asthmatic person cannot be performed without some element of risk. Two of the 1,034 patients in the present study died after bronchoscopy. One died immediately after bronchoscopy and the other within a few hours afterward. No necropsy was performed in the former case, but in the latter there was edema of the medulla at postmortem examination. Both of these patients had severe status asthmaticus, and the deaths might have been avoided if the bronchoscopy had been done with the patient under ether anesthesia. In 13 of the 327 patients with bronchostenosis, subcutaneous emphysema developed after bronchoscopy and dilatation of the stenosed bronchus. All these patients were treated conservatively, and the emphysema disappeared in 10 to 14 days. There were no deaths from bronchoscopy among the patients who had bronchostenosis.

BRONCHOSTENOSIS FROM OTHER CAUSES

Among the 1,034 consecutive patients with asthma who underwent bronchoscopy we found, in addition to the patients with benign bronchostenosis caused by inflammation, 11 patients whose stenosis was caused by a primary malignant lesion complicating asthma. In all 11 cases, malignant disease was suspected prior to bronchoscopy. In 1942, two of us (L. E. P. and H. J. M.) with Maytum [6] reported three cases of primary carcinoma of the bronchus complicating asthma. One may also encounter stenosis resulting from ulceration of calcareous material into a bronchus from a hilar lymph node, tuberculosis, the presence of a foreign body, or any other cause of constriction of the bronchus, whether extrinsic or intrinsic in origin. In all such instances, correct diagnosis is crucial and usually depends on bronchoscopic examination, the additional information obtained from tissue removed at the time of bronchoscopy, cell studies using the Papanicolaou technique, and smears and cultures obtained from the bronchi at the time of bronchoscopy.

Site of Bronchostenosis in 327 Asthmatic Patients

Right Lung		Left Lung	
Lobe and Segment	No. of Cases	Lobe and Segment	No. of Cases
Upper lobe		Upper lobe; upper division	
Apical	0	Apical posterior	0
Posterior	0	Apical anterior	0
Anterior	0		
Middle lobe		Upper lobe; lower (lingual) division	
Lateral	0	Superior	1
Medial	0	Inferior	0
Lower lobe		Lower lobe	
Superior	207	Superior	121
Medial basal	12	Anterior-medial basal	0
Anterior basal	0	Lateral basal	3
Lateral basal	3	Posterior basal	2
Posterior basal	3		
		Abnormal bronchus (lower lobe)	1
Upper lobe bronchus	4	Lower lobe bronchus	3
Middle lobe bronchus	8	Main bronchus	2
Lower lobe bronchus	1		

TREATMENT

The treatment of bronchostenosis, as has already been indicated, consists of dilatation of the stenosed bronchus and aspiration of the retained secretions. The results of such treatment are excellent, as measured by the relief of the patient, the subsidence of fever and severe paroxysmal cough, the eventual reduction in the amount and improvement in the character of the sputum, the improvement in the course of the bronchial asthma and, in many cases, the immediate reversal of physical and roentgenologic signs of bronchial obstruction. Recurrences can and do take place, however, as previously noted; they can best

6. Prickman, L. E.; Maytum, C. K., and Moersch, H. J.: Asthma and Primary Carcinoma of the Bronchus, J. Allergy **13**: 261-267 (March) 1942.

be prevented by having the patient avoid or promptly treat respiratory tract infections.

Patients who have asthma are usually tolerant of careful bronchoscopy as done by an experienced bronchoscopist. They should have a complete general examination and, in addition, special examinations, such as an allergic survey, examination of the nose and sinuses, and roentgenologic studies of the thorax and sinuses. Sputum when present should be examined for tubercle bacilli and malignant cells before bronchoscopic examination. If an episode of bronchostenosis is occurring and the temperature is high, the acute process should be allowed to subside before bronchoscopy is carried out. Rarely do patients with asthma object to bronchoscopy. Many patients are aware that something is interfering with the raising of their bronchial secretions, which previously had been relatively easy to raise, and are almost eager for the procedure to be done.

RESULTS OF TREATMENT

Letters of inquiry were sent to patients who were examined at the Mayo Clinic in 1950 and were found to have bronchostenosis complicating asthma. These patients all had had dilatation of the stenosed bronchi. Letters were sent also to an equal number of patients who had asthma and who on bronchoscopic examination were found not to have bronchostenosis. This control group was also treated at the Mayo Clinic during 1950. The results of dilatation of stenosed bronchi complicating asthma are similar to the results Schmidt [4] reported in the dilatation of stenosed bronchi associated with benign, nontuberculous conditions. Sixty-six per cent of his patients obtained favorable results from dilatation, while 60.5% of the patients in our series were immediately improved after dilatation of the stenosed bronchus, and 63.6% noted some improvement during the next several months following bronchoscopy. The asthmatic status has remained improved in 60.5% of these patients. In the control group, 55% of the patients experienced some improvement immediately after bronchoscopy; the number in which there was improvement in the succeeding several months dropped to 48%, and only 45% thought the status of their asthma was improved at the time the questionnaire was received. Thus, from these results, it appears that patients who had bronchostenosis complicating their asthma received a substantial and lasting benefit from dilatation and aspiration of the stenosed bronchus, while in the control group not only were a smaller number improved but the apparent benefit was more transient.

SUMMARY

The syndrome of bronchostenosis and the records of 327 patients who had bronchostenosis complicating asthma and who were seen during the decade ending in 1950 are reviewed. All age groups were represented. The largest number of cases in any decade of life was in the age group 40 to 49 years inclusive. There were 182 female and 145 male patients in the series. Treatment of bronchostenosis consists of dilatation of the stenosed bronchus and aspiration of the retained secretions. We found that 60.5% of patients were immediately improved after dilatation of the stenosed bronchus, and 63.6% experienced some improvement during the next several months following bronchoscopy. The asthmatic status remained improved in 60.5% of these patients.

RATE OF PULMONARY AND TISSUE GASEOUS NITROGEN ELIMINATION AS A MEASURE OF PULMONARY EFFICIENCY

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As pointed out by Fowler [1] in his excellent review on tests of pulmonary functions, one of the principal difficulties encountered by respiratory physiologists in the performance of such studies has been the lack of a satisfactory technique for the routine measurement of the residual or of the functional residual air. As a result, too little attention has been paid to the role these important components of the lung volume may play in pulmonary function.

In 1948 Boothby, Lundin, and Helmholz [2] reported a new test for pulmonary and circulatory efficiency based on the use of the nitrogen meter for measuring the rate and amount of gaseous nitrogen eliminated into a closed circuit respiration apparatus by the patient while he is breathing oxygen. The respiratory apparatus used is an elaboration of a closed circuit basal metabolism apparatus and consists of a water-sealed gasometer with a capacity of 40 liters and an air blower capable of producing a flow of at least 80 liters per minute through the closed circuit system, together with corrugated tubing and valve attached to a mouthpiece. There is a soda lime container to remove the carbon dioxide, and there are filters to remove the soda lime dust and any oil vapor from the blower. The spirometer records the respiratory movements, from which the respiratory volume, tidal air, vital capacity (BTPS [3]), and oxygen consumption

Miss Elizabeth H. Roorbach, A.B., gave technical assistance in this study.

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From the Respiration Laboratory, the Lovelace Foundation for Medical Education and Research. This study was aided by a grant from the U. S. Public Health Service.

1. Fowler, W. S.: Functional Residual Capacity and Residual Capacity, in Methods in Medical Research, Comroe, J. H., Jr., editor-in-chief, Chicago, Year Book Publishers, Inc., 1950, vol. 2, pp. 181-188.

2. Boothby, W. M.; Lundin, G., and Helmholz, H. F., Jr.: A Gaseous Nitrogen Elimination Test to Determine Pulmonary Efficiency, Proc. Soc. Exper. Biol. & Med. **67**: 558 (April) 1948.

3. BTPS = body temperature and ambient pressure saturated with 47 mm. Hg water vapor on assumption that the pulmonary temperature is 37 C.

(STPD [4]) can be calculated, as in an ordinary basal metabolism test lasting half an hour. To allow for variation in the size of the subject, the values are usually expressed per square meter of body surface (DuBois).

The essential new feature of the method is the use of one or two nitrogen meters, which are improvements of the Lilly-Anderson [5] nitrogen meter designed by them for the United States Navy during World War II. These meters are extremely rapid and can record photographically instantaneous changes in nitrogen concentrations in inspired and expired air. The rate at which this nitrogen exchange takes place when the subject begins to breathe oxygen is important because it is indicative of the rate at which oxygen can go in and carbon dioxide come out of the alveoli. The meters are calibrated by analyzing samples obtained at the beginning and at the end of the test. The intermediate readings of the total accumulated nitrogen are linear over the range used (0 to 15%) when the water vapor content is held constant as in a closed circuit system.

The calibrated nitrogen meter readings multiplied by the volume of the gasometer readings gives the total amount of nitrogen eliminated and can be calculated for short periods as frequently as desired. In practice, readings are taken every half minute for the first 3 minutes; then they are taken every minute for the next 10 minutes, and finally at 5 minute intervals until the end of the experiment. These results are plotted on ordinary arithmetic coordinate paper and on double logarithmic paper. These plots are very characteristic and are sharply defined. The slope of the lines of both plots can be used to separate the gaseous from the pulmonary tissue nitrogen.

The ability to measure gaseous nitrogen elimination permits the following observations: 1. From the point of view of the Air Force, the early studies by Benson, Lovelace, and Boothby used by Boothby, Luft, and Benson [6] demonstrated that in normal persons in the steady state the time required to lower below one-half the average pressure of gaseous tissue nitrogen in the body could be easily calculated, and thus the danger from decompression sickness to air crews at high altitudes could be reduced. 2. The data of accumulated pulmonary and tissue nitrogen elimination, when the patient is breathing oxygen, can be expressed as a function of time. The tissue nitrogen (after subtraction of the pulmonary nitrogen), with the patient in a steady state, plots as a straight line on log-log paper, and from this the instantaneous rate of nitrogen elimination per minute can be determined. On this rate-per-minute line for tissue nitrogen it is possible to interpolate the values at one-half and at one minute, thus permitting the determination of the circulation rate at rest and at work in subjects or patients who can "wash out" by five deep breaths all of their pulmonary gaseous nitrogen in half a minute. 3. It is possible in normal subjects, and in most patients, to determine with accuracy the volume of the nitrogen in the residual air. Thus the capacity occupied in the lungs by these subdivisions of lung volume can be calculated at body temperature and pressure, saturated (BTPS). 4. The time required under basal conditions to wash out the functional residual air of normal subjects, breathing oxygen, can also be determined. As previously mentioned, this is important because, if carefully done under standardized conditions, it is indicative of the freedom with which oxygen can enter the alveoli and carbon dioxide can be eliminated. This time, under strictly basal conditions, is usually between three and four minutes. In patients with pulmonary emphysema, or with large pulmonary cavities, the time required is definitely increased—in some instances to 10 minutes. An increase in the apparent pulmonary nitrogen may be due to large intrathoracic tumors of certain types, and this complicates the differential diagnosis, especially if these tumors also contain cavities or air blebs. In patients with a decreased residual and with a very small or no expiratory reserve, and who, therefore, have shallow and very rapid breathing, the wash-out time may be shortened to less than two and one-half minutes under as near basal conditions as can be obtained. 5. The tidal air and the vital capacity, which is composed of inspiratory and expiratory reserve air, are determined as in the past. In addition, the determination of the residual air and the total lung capacity increases the clinician's ability to estimate the subject's pulmonary efficiency. 6. H. Colldahl and Gunnar Lundin [7] have recently reported, from the Allergy Laboratory of the Medical Clinic and Department of Air Medicine of the Institute of Physiology, Lund, Sweden, a very interesting study under strictly standardized conditions on the quantitative registration of the severity of asthma in provocation tests in patients suffering from asthma. They use this as an additional method to establish the causative factor and to follow the effect of treatment.

*Approximate Values of Pulmonary Air Divisions Per Square Meter of Body Surface (BTPS)**

Tidal volume per breath (T. V./b).....	200-300 cc. per square meter
Inspiratory reserve air (I. R. A.).....	1,700 cc. per square meter
Expiratory reserve air (E. R. A.).....	500 cc. per square meter
Residual volume (R. V.)..... (Includes anatomic dead space = 70 cc. per square meter)	800 cc. per square meter

Functional residual volume (F. R. V.) is the sum of E. R.A. and R. V.

Vital capacity (V. C.) is the sum of I. R. A. and E. R. A.

Total capacity (T. C.) is the sum of I. R. A., E. R. A., and R. V.

All volume measurements are made from a line drawn along the bottom of the resting tidal volume. The level of this line in relation to the maximum inspiratory and expiratory volume may be of physiological and clinical importance. The interindividual variability of this line is large; its intraindividual variability can be affected by character of respiration and is probably a large component of, but not identical with, the variation of functional dead space of Douglas and Haldane.

* There is considerable variability even in normal persons.

Drinker [8] summarizes the following important estimates concerning the functioning capacity of the lungs

4. STPD = standard temperature and pressure dry (760 mm. Hg and 0 C, dry).

5. Lilly, J. C., and Anderson, T. F.: Nitrogen Meter, CMR Report No. 299, 1944. Lilly, J. C.: Respiratory System: Methods; Gas Analysis, in Medical Physics, edited by O. Glasser, Chicago, Year Book Publishers, Inc., 1950, vol. 2, p. 845.

6. Boothby, W. M.; Luft, U. C., and Benson, O. O., Jr.: Gaseous Nitrogen Elimination: Experiments When Breathing Oxygen at Rest and at Work, with Comments on Dysbarism, J. Aviation Med. **23**: 141 (April) 1952.

7. Colldahl, H., and Lundin, G.: Ventilatory Studies of the Lungs in Asthma: Nitrogen Elimination Efficiency of Lungs During Oxygen Breathing in Patients with Asthma Bronchiale: Method for Objective Registering of Even Mild Asthmatic Breathing Examined in Provocation Tests, Acta allergol. **5**: 37, 1952.

8. Drinker, C. K.: Pulmonary Edema and Inflammation: Analysis of Processes Involved in the Formation and Removal of Pulmonary Transudates and Exudates, Harvard Monograph in Medicine and Public Health, no. 7, Cambridge, Mass., Harvard University Press, 1945.

in normal persons of average size: 1. Alveoli.—The surface for gas exchange provided by the alveoli of the lung in an adult is approximately 90 sq. m. It is estimated that there are 750 million alveoli in man, and that at rest one-twentieth of their total aerating surface is used. 2. Capillaries.—The estimated capillary area of the lungs available for gas exchange is approximately 140 sq. m.

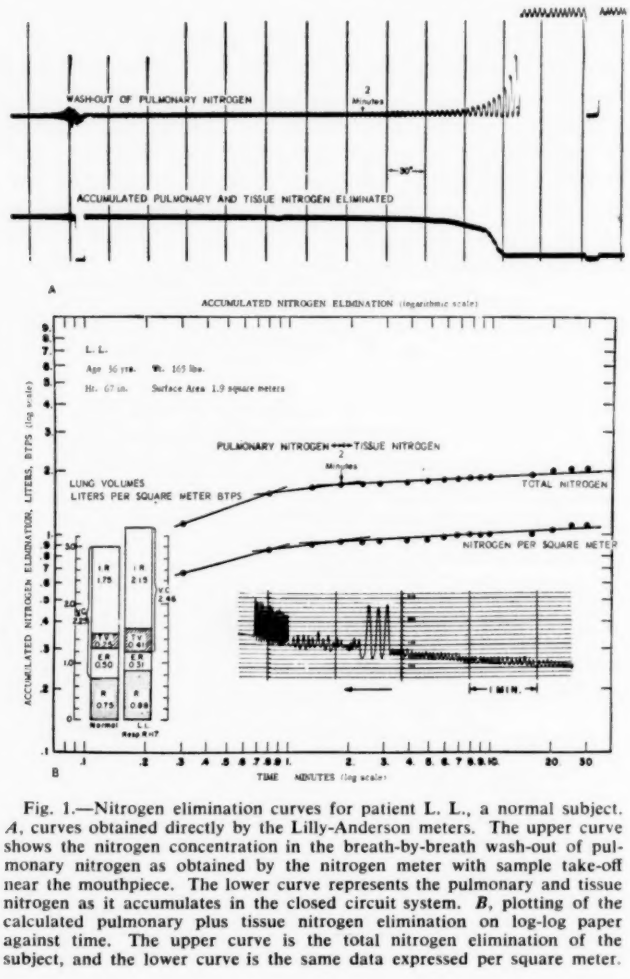

Fig. 1.—Nitrogen elimination curves for patient L. L., a normal subject. *A*, curves obtained directly by the Lilly-Anderson meters. The upper curve shows the nitrogen concentration in the breath-by-breath wash-out of pulmonary nitrogen as obtained by the nitrogen meter with sample take-off near the mouthpiece. The lower curve represents the pulmonary and tissue nitrogen as it accumulates in the closed circuit system. *B*, plotting of the calculated pulmonary plus tissue nitrogen elimination on log-log paper against time. The upper curve is the total nitrogen elimination of the subject, and the lower curve is the same data expressed per square meter.

This huge surface, by virtue of the net-like arrangement of the capillaries, is very readily available for even distribution, without serious pressure changes, of the volume of blood thrown into it by each ventricular contraction. It is perfectly adequate for receiving all the blood that comes to it—approximately 4 liters per minute at rest to over 30 liters per minute at work—even when changing back and forth very rapidly from rest to work.

In the table are the numerical values frequently found in normal persons for the important subdivisions of the pulmonary air, expressed at BTPS. Variations in the size of the person are roughly allowed for on the basis of square meter surface area as we are accustomed to do for the basal metabolic rate; however, the variation, even in normal persons, is much greater than are the variations in basal metabolism, and they depend on many as yet incompletely studied factors.

In an analysis of the two nitrogen elimination curves (fig. 1*A*) in a normal subject, the upper curve, because of the variation in water vapor in inspired and alveolar air, and because of the difference in amount of carbon dioxide, is only approximately quantitative. Nearly all of the pulmonary nitrogen is washed out in about two minutes after the subject starts breathing oxygen. The subject was not under basal conditions; therefore, the respiratory rate was increased. Ordinarily, in the normal person under strictly basal conditions the wash-out time is approximately three to four minutes. The lower curve, depicting the pulmonary and tissue nitrogen as it accumulates in the closed circuit system, represents the oxygen-nitrogen concentration quantitatively, because the water vapor is constant and the carbon dioxide is removed. The salient feature to be noted here is that, after about 12 seconds delay, owing to time required for mixing in the closed circuit apparatus after the change over to oxygen, there is a marked rise in the accumulated nitrogen with sample take-off on the inspiratory side of the closed circuit system. By means of a calibrated scale, the percentage amount of nitrogen accumulated in the gasometer circuit can be determined and the total amount of nitrogen eliminated easily calculated from the gasometer volume. The characteristic bend or knee in the nitrogen elimination curve (fig. 1*B*), which separates pulmonary from tissue nitrogen, occurs at two minutes. It is the moment at which essentially all the pulmonary nitrogen has been eliminated, and from that point onward to the right the curve is an expression

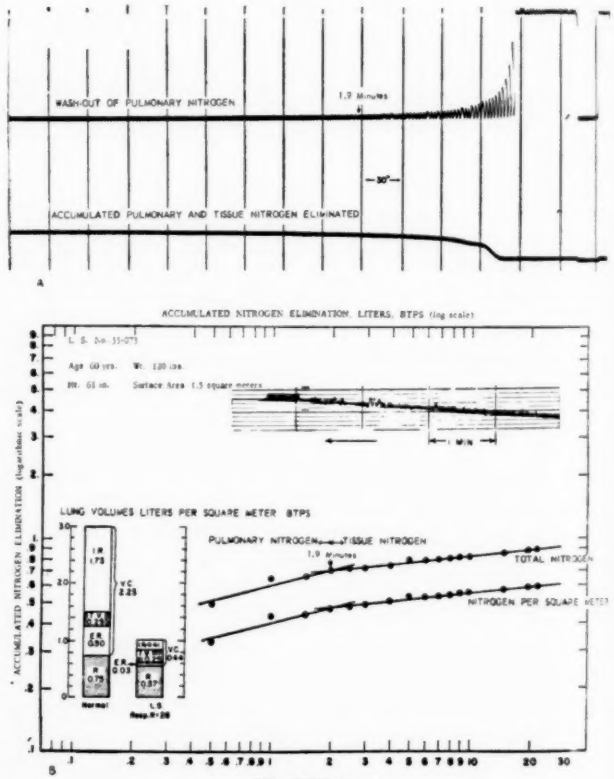

Fig. 2.—Nitrogen elimination curves for patient L. S., who had marked cardiac decompensation and pleural effusion, and therefore decreased residual nitrogen. *A*, the pulmonary wash-out required about 1.9 minutes as is shown in the upper curve. The lower curve represents the accumulation of the pulmonary and the tissue nitrogen. *B*, the upper curve represents the standard respiratory curve, and the log-log plot, the lower curve, shows that the amount of residual air was small.

of tissue nitrogen elimination, the rate of which is mainly dependent in normal persons on circulation rate. This portion of the curve, after subtraction of the pulmonary

nitrogen, has been shown by Boothby, Lovelace, and Benson to be a straight line in normal persons on log-log paper for at least 150 minutes. Subsequently, Boothby, Lundin, and Helmholz [2] found this straight line relationship of tissue nitrogen in normal persons under basal conditions to last for five hours. The spirometer respiratory curve shows an average tidal volume of approximately 410 cc. per square meter per breath. The inspiratory and expiratory reserve air values can be calculated from the maximal inspiration and expiration. The sum of these is the vital capacity. The level of the tidal air in relation to the inspiratory and expiratory reserves varies greatly even in normal persons, thus affecting the functional residual air volume. The interindividual residual air is less variable than the functional residual air, provided the subjects can readily expire completely.

The nitrogen elimination curves obtained for a patient with marked cardiac decompensation and pleural effusion as shown by x-ray examination showed the pulmonary nitrogen wash-out to require about 1.9 minutes (fig. 2*A*). The pulmonary nitrogen level was very low, indicating a marked decrease in freely functioning alveoli.

The standard respiratory curve is shown at the top in figure 2*B*. The breathing is rapid and shallow. The subject has practically no measurable expiratory reserve (30 cc.) and an inspiratory reserve of only 410 cc.; therefore, the vital capacity was only 440 cc., of which about 250 cc. were tidal volume per breath. Each breath, therefore, was more than half of the extremely small vital capacity, and, in consequence, there was almost no reserve for even minimal exercise. The log-log plot showed that the residual air was small, amounting to only 570 cc. per square meter, or a total capacity of only 1,010 cc. As could be expected, this patient was practically bedridden.

In a person who has had a tentative diagnosis of pulmonary emphysema of many years' standing (fig. 3) the differentiation between pulmonary and tissue nitrogen is less distinct than in normal subjects and, therefore, complicating factors may be indicated. The spirometer graph demonstrates the fact that the ventilation per minute is greatly increased, mostly as a result of the rapid breathing with a small increase in volume per breath. The inspiratory and expiratory reserves are greatly diminished below normal. The residual air is greatly increased. Following the three maximal breaths there is indication of inability to expire. Helmholz [9] has shown marked examples of this phenomenon, which he labeled "air trapping." The bar graph shows that the residual air is over three times as great as that seen in the normal person. Apparently, in order better to aerate this enlarged residual air volume, the tidal volume is moderately increased. The data suggest that possibly in some patients the residual air should be divided into two parts: (*a*) the free residual air and (*b*) the restricted residual air of cavities or "blebs."

SUMMARY

The purpose of this paper is to call attention to some of the information in regard to pulmonary function that can be obtained and recorded by new types of instruments, especially the nitrogen meter constructed during World War II at the Johnson Research Foundation, Philadelphia, under director Detlev W. Bronk. We have presented three examples in which the rate and the amount of pulmonary nitrogen elimination was studied in addition to the usual diagnostic procedures for estimating pulmonary efficiency. One of the examples is a normal person; another is a patient with decreased residual nitrogen, indicating an exceedingly small volume of functioning pulmonary tissue, that is, of freely open alveoli; and the third is a patient in whom the residual nitrogen is very greatly increased, probably from several causes, such as dilatation of alveoli, cavities, and intrathoracic tumor tissue.

There is no doubt that, in the near future, the nitrogen meter and other instruments of this type that can be used to estimate pulmonary function can be improved. The terminology used by the clinician, by the surgeon, by the respiratory physiologist, by the roentgenologist, by the anatomist, and by the pathologist must be gradually modified and harmonized in order to correlate the functional data with the anatomic findings both in health and in disease. At the present time this method of study of pulmonary function, with new instruments, is comparable in development to that of the roentgen ray two score years ago. This has indeed been an interesting era of diagnostic development brought about by specialists in each field. The problem of the future will involve correlation of the various types of investigation.

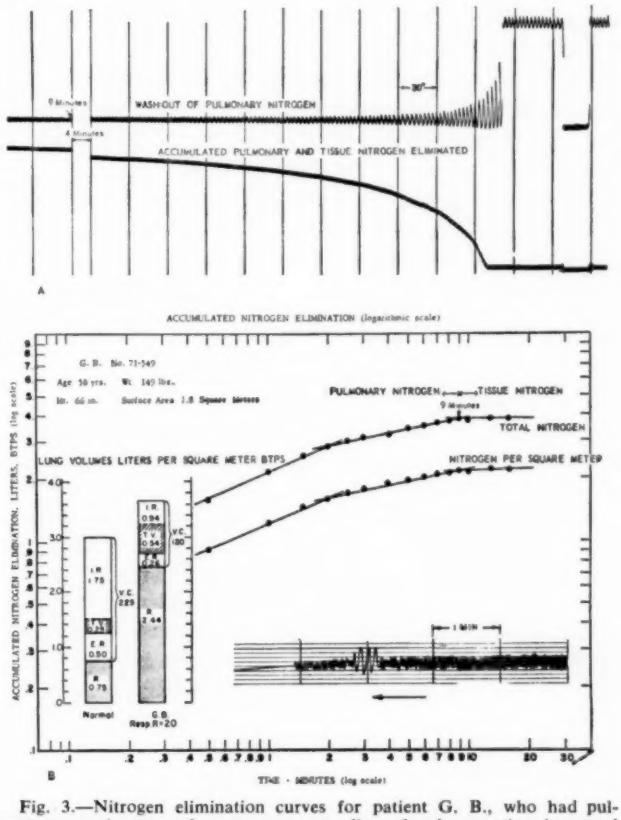

Fig. 3.—Nitrogen elimination curves for patient G. B., who had pulmonary emphysema of many years standing, thereby creating increased residual nitrogen. *A*, the upper curve indicates the extremely long pulmonary wash-out time of nine minutes. It was difficult, on the lower curve, to differentiate pulmonary from tissue nitrogen. *B*, the differentiation between pulmonary and tissue nitrogen is more distinct on log-log paper.

4800 Gibson Blvd. S.E. (Dr. Boothby).

9. Helmholz, H. F., Jr.: Symposium on Dyspnea: Laboratory Studies of Patients Whose Chief Complaint is Dyspnea, Proc. Staff Meet., Mayo Clin. **27**: 61 (Jan. 30) 1952.

PROBLEMS OF ANESTHESIA FOR SURGICAL PROCEDURES WITHIN THE CHEST

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Surgical procedures involving opening of the thoracic space have multiplied in incidence and variety many times in the past decade and even in the past five years. With the advent of new techniques and drugs, surgery involving the lungs has become commonplace as compared with 1942. Esophageal surgery, ranging from that for carcinoma in the aged to repair of tracheoesophageal fistula in the newborn, is capably done over the entire country. Certain neurosurgical procedures may involve entry into the pleural space, and intrathoracic cardiac or vascular surgery has been developed in recent years to a spectacular degree. Most sizable communities are beginning to regard operations on the mitral valve or coarctation of the aorta as operations with definite indications and predictably bright prognoses. Such being the case, it seems desirable that referring physicians should have some conception of the problems, accidents, and complications encountered in the operating room in the course of such procedures.

The conclusions presented in this paper are drawn entirely from several years of private practice in anesthesia. During the past four years, we have conducted the anesthesia for about 1,600 intrathoracic operations, including 1,350 pulmonary procedures and 150 cardiac or vascular operations. In the latter group are such cases as mitral or pulmonary stenosis, aortic coarctation, and patent ductus arteriosus. In addition, there were 25 cases of tracheoesophageal fistulas, 50 cases of esophageal resection, and a number of cases of miscellaneous disorders.

CHOICE OF ANESTHETIC

There is some difference of opinion, or at least of emphasis, concerning the choice of anesthetic agents to be used as well as the techniques to be employed. Much has been written on this subject, and it does not seem necessary to discuss it fully at this time. It is increasingly self-evident, however, that the particular agent used is of far less importance than the ability of the anesthesiologist. Ether probably is used more frequently than other agents for intrathoracic procedures, because respiration is deeper and less manual control is required on the part of the anesthesiologist. Ether is slower acting, and the plane of anesthesia is, therefore, more easily maintained at a given level than is the case with cyclopropane. It is possible that ether affords more protection than other agents against cardiac arrhythmias. Cyclopropane also has considerable value in anesthesia for chest surgery. Rapid inductions and intubations with thiopental (Pentothal) sodium, curare, and cyclopropane subject the patient to far less physiological trauma, if carefully done, than do slower procedures. Early intubation permits a good patent airway with immediate facilities for suction, if necessary, as well as for a change of agent to ether, if desired, without the intervening complication of laryngospasm. Such techniques must, however, be carefully individualized to fit the particular situation presented by each patient.

Read at the Sixth Clinical Session of the American Medical Association, Denver, Dec. 4, 1952.

RESPIRATORY PROBLEMS

There are many problems encountered during the surgical procedure, the first general group of which are those related to the respiratory system. By the nature of the surgery, such cases present the problem of an open chest and a collapsed lung. They require, therefore, use of endotracheal techniques, whether in the aged or the newborn. The latter, in particular, require highly specialized equipment, from a wide selection of endotracheal tubes to breathing bags and soda lime absorbers of a size to correspond to the tidal volume of the patient.

Laryngeal edema as a result of endotracheal intubation is rarely a significant factor in adult patients. The postoperative occurrence of this complication is seen more frequently in infants. In most instances, steam inhalations are sufficiently efficacious, although on rare occasions tracheotomy may be indicated. In any case, the considerable advantages of an endotracheal airway greatly outweigh the infrequent complications that may result from its use.

The very existence of a collapsed lung presupposes the necessity at any time or at all times of the use of techniques of controlled or compensated respiration. With a mobile mediastinum, the problem of paradoxical breathing is almost constant. Thus the anesthesiologist is torn between his responsibility to maintain an adequate tidal volume by means of positive pressure controlled techniques and a desire not to balloon the lungs overmuch into the surgical field.

The appearance of secretions, pus, or blood in the bronchi is a common occurrence that may, on occasion, lead to serious respiratory obstruction and asphyxia. The anesthesiologist must be constantly on the alert for the sudden appearance of massive hemorrhage, the gradual accumulation of bronchial secretions, and obstruction of the bronchi by debris, such as pieces of free cancer tissue. Suction facilities must be good and instantly available, and the head-down position should be used in urgent circumstances. The widespread preoperative use of the antibiotics has almost led to the disappearance of the so-called wet cases of bronchiectasis, in which pus literally poured from the endotracheal tube. This has almost obviated the need for afternoon schedules that permit planned drainage of the tracheobronchial tree.

Surgery and anesthesia in asthmatic patients often present special and sometimes serious problems. These patients occasionally have large quantities of thick, glairy mucus in the bronchial tree, which is difficult or impossible to remove. Bronchospasm may be present

initially, leading to slow difficult inductions, or may develop at any time during the procedure. Since bronchospasm is mediated by vagal stimuli, the use of thiopental sodium or cyclopropane is theoretically contraindicated, and ether, which has a sympathomimetic action, is usually the agent of choice. Increased dosage of atropine or scopolamine before or during the anesthesia may be helpful in blocking vagal action.

Of all the preexisting pulmonary complications, the presence of advanced emphysema is perhaps the most serious. In patients with this condition anesthetization is often slow and oxygenation difficult. The recovery of the patient following anesthesia may be relatively delayed, under circumstances in which it is especially desirable that the patient regain his cough reflexes. Far advanced emphysema is often coupled with an increased load on the right ventricle, and complete or partial resection of one lung may place an increased and sometimes lethal burden on the heart. Any reduction of the oxygenating capacity of the lungs may be serious. Especially in this type of patient, careful preoperative evaluation of pulmonary function is essential.

CARDIOVASCULAR PROBLEMS

Cardiovascular problems and complications are legion in cases of surgical intervention for the correction of such developmental defects as patent ductus arteriosus and coarctation of the aorta or for the improvement of efficiency of the heart and circulation in mitral stenosis and tetralogy of Fallot. They run the gamut from hemorrhage and shock to hypertension and cerebrovascular accidents, from simple, relatively benign arrhythmias to cardiac arrest. The nature of the pathological condition involved, with resultant alterations in hemodynamics, blood oxygen saturation, and cardiac irritability and reserve, makes the occurrence of the complications probable rather than the reverse. The predictably good results these patients may enjoy today have been made possible only by the combination of several factors: careful preoperative evaluation of the patient, adequate preparation before surgery, close attention to detail, and the invaluable aid of a competent cardiologist and the making of a continuous electrocardiographic tracing during the operation.

Arrythmias are high on the list of complications that cause concern in the operating room. The cause of arrhythmias is not always clear. Many patients come to surgery arrhythmic, most commonly with auricular fibrillation. Merely opening the chest may cause the heart to beat irregularly. Certainly the opening of the pericardial sac, handling of the heart itself, injection of the base of the auricular appendage, application and removal of clamps, and other factors may at times cause a variety of arrhythmias. Undoubtedly, suboxygenation makes the heart more irritable and increases the likelihood of the occurrence of the more serious abnormal rhythms. Many arrhythmias can not be detected by ordinary blood pressure and pulse determinations. A successful outcome is more assured if an electrocardiograph is attached to the patient on the operating table and a cardiologist is present to interpret the readings and advise on the proper drugs and dosages to be used.

One of the commoner occurrences is a significant change in rate of the heart, with or without a change in pressure. Usually the heart rate gradually becomes more rapid during surgical intervention for mitral stenosis. On occasion, however, the rate may become too rapid too early in the procedure. Intravenous administration of 0.15 cc. of a 1:2,000 solution of neostigmine (Prostigmin) effectively slows the rate. In some cases, there occur a rising rate, a falling blood pressure, a narrowing pulse pressure, and an electrocardiographic tracing showing left ventricular strain. The drug of choice here may be lanatoside C (Cedilanid), 1 to 2 cc. given intravenously. Occasionally, the development of a bradycardia may indicate increased vagal tone. Administration of 1/300 grain (0.2 mg.) of atropine intravenously is often helpful in this circumstance. A bradycardia that does not respond to atropine is of grave significance. It is seen oftener in cyanotic patients, such as those with tetralogy of Fallot. If it occurs early and does not respond to drugs or to inflation of the collapsed lung, the termination of the case may be fatal. Occasionally, the blood pressure drops to a level sufficient to cause concern, with no change in rate and no material change in the electrocardiographic tracing. Administration of 0.5 to 1 cc. of a mild vasopressor has proved beneficial in such instances.

PROBLEM OF BLOOD LOSS

The problem of blood loss and its replacement is ever present in this type of surgery. During some mitral valvulotomies, the blood loss may not exceed 200 or 300 cc., but during the resection of a coarctation of the aorta, it is common for the patient to lose 1,000 to 1,500 cc. in opening the chest, for collateral vessels in the chest wall are large and numerous. There is always the possibility of a sudden accidental loss of blood in considerable quantity. Blood typing and cross matching should be done on all patients, and an adequate supply of blood should be available at surgery; 1,500 cc. is the amount usually on hand before surgery begins. More is ordered as surgery proceeds and as circumstances indicate. As soon as the patient is placed in position, a needle of adequate bore, from 15 to 18 gage, is introduced into a suitable vein in the hand or forearm. A sphygmomanometer pump is at hand to speed the administration if it becomes necessary. Exposing the vein for introduction of the needle is rarely necessary, except in cases of infants and small children.

The amount of blood administered varies with each patient. The objective is always to replace blood while it is being lost. At the same time, it is important not to overload patients who are old and debilitated or those whose cardiac reserve is poor. Blood loss is estimated from that collected in the suction bottle and from the number, size, and saturation of the sponges. Observation of the patient's color, skin temperature, capillary return, blood pressure, and pulse pressure is helpful in estimating whether there is need for more speedy blood replacement.

TIME FACTOR

The factor of time is exceedingly important in this type of surgery and anesthesia. It has been fashionable in recent years to say that, with good anesthesia and other modern facilities, time is an unimportant factor. Even assuming that the best anesthesia and surgical ability are provided and that blood replacement is good, the elapsed time is one of the major factors in the ultimate welfare

of this group of patients. The time anticipated for a surgeon to complete a given procedure in a poor risk patient may be the final determining factor in deciding whether to operate in the first place. The good, rapid surgeon certainly will have a far wider selection of procedures and patients than will the good, slow surgeon.

Most of the adult patients in this type of practice are physiological cripples. They are usually patients with seriously impaired pulmonary or cardiac function or both. The unrelenting processes of disease and old age, coupled with major surgical procedures often involving the impaired organs and basic physiological functions, make necessary the extremest care in planning such operations. It must be borne in mind, furthermore, that some of this group of patients may have so little pulmonary or cardiac reserve that major intrathoracic surgery simply cannot be considered. Errors of judgment in this area perhaps account for the great majority of deaths in any large series of intrathoracic surgical cases. The newborn baby with a tracheoesophageal fistula will, on the other hand, often withstand the most astonishing degree of abuse at the hands of both the surgeon and the anesthesiologist, because he usually possesses a good heart and a good pair of lungs.

CONCLUSIONS

In closing, it must be emphasized that all of the many segments of the problem discussed enter into selection of patients for chest surgery and determination of the prognosis. All or most of the criteria mentioned must be met for surgery to be permitted. These many elements include the skill, judgment, and speed of the surgeon, the skill and judgment of the anesthesiologist, and the ready availability of any amount of blood required, coupled with the early recognition and immediate, unruffled treatment of crises by both surgeon and anesthesiologist working together as a friendly, sympathetic team. With a combination of such factors present, many lifesaving, health-giving surgical procedures may be made available to an increasingly large group of patients otherwise destined to a life of chronic ill health or early death.

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BLOOD GROUPING TESTS FOR EXCLUSION OF PATERNITY

RESULTS IN ONE HUNDRED EIGHT CASES

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The scientific foundation on which the value of blood tests in paternity disputes rests is the individuality of different persons' blood and the fact that the characteristics that determine this individuality are inherited according to definite principles. All inherited characteristics are determined by genes, which are present in rod-like bodies called chromosomes. These latter occur in pairs in the somatic cells, and one member of each pair is present in the nucleus of the male sperm and in that of the female ovum. Thus, each parent makes an equal genetic contribution to the blood group characteristics present in the red blood cell envelop of their offspring. In 1900 and 1901, Landsteiner discovered two of these blood group characteristics, which he called the A and B factors. Four combinations of these determine the blood groups of the A-B-O blood group system. Since then, however, the matter of blood groupings has become complicated, because, by now, more than nine independent blood group systems have been described, which determine more than 50,000 varieties of blood. Thus, the complete blood grouping of a person may some day become almost as distinctive as his fingerprint.

With the acquisition of this scientific knowledge, its value for the solution of medicolegal problems has been established.[1] It seems worth while to report this series of 108 cases of disputed paternity, since only two other workers using three blood group systems have reported significant series of cases.[2] These tests have been used both in the United States and abroad. The states of New York, Wisconsin, Ohio, New Jersey, Maryland, South Dakota, North Carolina, Maine, and Pennsylvania have laws giving the courts power to order blood grouping tests when indicated in paternity disputes.[3] In states where no such law exists, tests can be carried out with consent of the parties involved, and the results are admissible as evidence. These tests may exclude paternity but can never prove it. While the results of an exclusion are admissible in evidence, they are not necessarily binding on the court. In my series, when the results proved nonpaternity, they were accepted as conclusive, and the outcome of the case was decided largely by results of the tests. Even though the blood tests cannot be used to prove paternity, a husband with merely doubt about the paternity of his child may derive great comfort if they fail to exclude paternity. In such instances, the results may deter legal action and actually save the marriage.

Proper performance and interpretation of the tests demands special knowledge, training, and experience.

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Because of space limitations, some of the bibliographic references have been omitted from THE JOURNAL and will appear in the author's reprints.

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3*a*. Schatkin, S. B.: Disputed Paternity Proceedings, ed. 2, New York, Mathew Bender & Company, Inc., 1947.

3*b*. Lombard, J. F.: Adoption, Illegitimacy and Blood Tests (Massachusetts Practice vol. 3), Boston, Boston Law Books Company, 1952, pp. 723-798.

Therefore, only qualified experts should undertake medicolegal cases of this nature. It is difficult to define the qualifications of an expert, but wide experience in the field is most important. The extent and quality of that experience can best be judged by the positions held and by the scientific work published. The tests, especially those for the Rh-Hr factors, are delicate and must be carried out meticulously to guarantee accurate results. Correct interpretation of the results requires experience and knowledge of both immunohematology and genetics. An understanding of the qualitative differences in the various agglutinogens is essential; for example, in the A-B-O system there are variations of the A agglutinogen designated as A_1, A_2, A_3, A_4, and so forth, here arranged according to the strength of their reactions with anti-A serum. The weakly reacting varieties require extremely potent serums. These differences of the A agglutinogen are not, at present, made use of in the exclusion tests.[4] A variant of the N factor, called N_2, is found only associated with M, giving rise to the type MN_2. This weakly reacting antigen can be detected only with special anti-N serum; otherwise the blood may erroneously be considered to belong to group M. Great care must be taken to avoid this pitfall. In the Rh-Hr system there are also weakly reacting antigens called variants,[5] which must be carefully taken into consideration to avoid error. The most important one is the Rh_0 variant, $\mathfrak{R}h_0$. Unless this factor is tested for by a special technique, such as person may erroneously be classified as Rh negative.

METHODS

Evidence submitted by the expert pertains to the results of examinations of the blood of persons involved in the dispute. The examination consists of a series of tests to determine the presence or absence in the red blood cell membrane of characteristics called agglutinogens. Of the various blood group systems now known,[6] only three are used medicolegally, namely, the A-B-O, the M-N,[7] and the Rh-Hr systems. (The S and s factors,[8] which form part of the M-N system, are not tested for, because such small quantities of the antiserums are available that they are used only for research and not for routine work.) The P, Lewis, Lutheran, Kell-Cellano, Duffy, and Kidd groups are not used at present for medicolegal purposes. As pointed out in a recent report,[4] the reasons for omitting these are that satisfactory, specific diagnostic serums are not available, that certain characteristics are demonstrable only by the indirect antiglobulin method, or that the mechanism of heredity is not as yet clearly established.

To determine the presence of the various factors that comprise the three systems used, a specimen of blood of each person involved in the controversy is obtained, preferably from a superficial vein. In certain instances, especially in newborn infants, capillary blood may be obtained by pricking the finger or heel. As far as the reliability of the tests is concerned, such capillary blood is equal in value to venous blood. The only precaution necessary is to be certain to obtain an amount sufficient to carry out all the necessary tests. Prior to drawing each specimen of blood, the name of the person is written on labels. As a check against typographical errors, additional information, such as "mother," "putative father," or "child" together with the age of the child if more than one is involved, is also put on the label. These labels are then attached to test tubes prior to actual drawing of the blood. When blood has been drawn and placed in the test tube, the operator again reads the label on the test tube to be absolutely certain that it bears the name of the person who donated the specimen. For further identification, fingerprints are taken, and in newborn infants footprints may be added.

The red blood cells of each person are washed with isotonic sodium chloride solution and a 2% suspension prepared. A series of tests is carried out on the cell suspensions, using antiserums for A, A_1, B, M, N, Rh_0, rh′, rh″, hr′, and hr″ factors. In fact, each of the tests should be made in duplicate with two different samples of each of these antiserums. A series of control cells the blood factors of which are known are also similarly examined. The serum of each person is tested against red blood cells known to belong to group O, A_1, A_2, and B. If the factor tested for is present, clumping of the cells results, whereas, if the factor is absent, no clumping results.

RESULTS WITH REPORT OF CASES

Each of the three blood group systems utilized contributes to the total chance of excluding paternity by a man falsely accused of being the father of a given child. The chance of doing this by the A-B-O system is about 18%, by the M-N system about 18%, and by the Rh-Hr system about 25%. When all three systems are used simultaneously, the chance is greater than 50%.

In the present paper, the results in 108 cases of disputed paternity are analyzed. In all cases, the blood samples were examined for the various factors of the A-B-O, M-N, and Rh-Hr systems, two different examples of each of 10 different antiserums being used. In some instances, examination for one or both Hr factors was obviously unnecessary, and the test was then omitted. Except for the earliest cases in this series and except in cases in which the test was obviously not indicated, the hr″ factor was tested for, two different samples of anti-hr″ serum being used.

The following basic principles, or laws, form the basis for the determination of nonpaternity: 1. Agglutinogens A, B, M, N, Rh_0, rh′, rh″, hr′, and hr″ must be present in the blood of one or both parents to be present in the blood of the child. 2. A group AB parent cannot have a group O child; a group O parent cannot have a group AB child. 3. A type M parent cannot have a type N child; a type N parent cannot have a type M child. 4. An hr′-negative parent cannot have an rh′-negative child; an rh′-negative parent cannot have an hr′-negative child. 5. An hr″-negative parent cannot have an rh″-negative child; an rh″-negative parent cannot have an hr″-negative child. (Serums for factor hr″ factor are rare, so that the

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7*a*. Race, R. R.; Sanger, R.; Lawler, S. D., and Bertinshaw, D.: The Inheritance of the MNS Blood Groups: A 2nd Series of Families, Heredity **3**: 205-213, 1949.

number of studies on this factor is small. For this reason, exclusion of paternity based on the hr″ factor must be qualified. For other reasons,[9] exclusions based on this law [10] call for slight qualification.)

The basic principle, namely, that characteristics present in the child's red blood cells are determined by joint contributions of the two parents, is identical in every case. If the examination shows that the child's cells contain factors not present in the blood of the couple involved, one is not or perhaps neither is a parent of the child. In the present series, the tests failed to show nonpaternity in 78 instances. A man not excluded by the tests may, nevertheless, really not be the father, because by coincidence his blood may contain the same characteristics as those of the actual father. To illustrate situations unsolvable by blood tests, the following interesting cases are reported.

Results of Blood Group Tests in Thirty Cases in Which Nonpaternity Was Proved

Case Number	Putative Father	Mother	Children	Blood Group System Determining Exclusions
1	O N Rh_1rh	A_1 MN Rh_2	A_2B N Rh_1Rh_2	A-B-O
2	O N Rh_0	O M Rh_0	(a) A_2 MN Rh_0	A-B-O
			(b) A_2 MN Rh_0	A-B-O
3	O N Rh_0	O MN Rh_0	B MN Rh_0	A-B-O
4	O N Rh_1Rh_1	B M Rh_1rh	A_1 MN Rh_1rh	A-B-O
5	O MN Rh_2Rh_0	O N Rh_2Rh_0	B N Rh_2Rh_0	A-B-O
6	A_1 M Rh_0	O MN Rh_1Rh_1	B M Rh_1rh	A-B-O
7	O MN Rh_0	O MN Rh_1Rh_1	B M Rh_1rh	A-B-O
8	B N Rh_1rh	O N Rh_1Rh_1	A_2 N Rh_1rh	A-B-O
9	O M rh	B MN Rh_1rh	O N Rh_0	M-N
10	O N Rh_2Rh_0	O MN Rh_2rh	O M rh″rh	M-N
11	O N Rh_1rh	O MN Rh_1rh	O M Rh_1rh	M-N
12	A_1 N Rh_1rh	B M Rh_1rh	O M Rh_1rh	M-N
13	A_1B N Rh_2rh	A_1 M Rh_2rh	B M Rh_2rh	M-N
14	A_1 N Rh_1	A_1 M Rh_2	A_1 M Rh_1Rh_2	M-N
15	O M Rh_2Rh_0	O N Rh_1Rh_1	(a) O N Rh_1Rh_1	M-N
			(b) O MN Rh_1Rh_1	Not excluded
			(c) O MN Rh_1Rh_1	Not excluded
16	O M Rh_1Rh_1	A_1 MN Rh_1Rh_1	A_1 N Rh_1Rh_1	M-N
17	O MN Rh_0	B MN Rh_1Rh_1	O N Rh_2Rh_0	Rh-Hr
18	A_1 N Rh_1Rh_1	A_1 MN Rh_1rh	A_2 MN rh	Rh-Hr
19	A_1 MN Rh_2Rh_1	A_1 M Rh_1Rh_1	A_1 MN Rh_1rh	Rh-Hr
20	O MN rh	A_1 M Rh_1Rh_1	A_1 M Rh_2Rh_0	Rh-Hr
21	O MN Rh_1Rh_1	A_2 N Rh_1Rh_1	A_2 N Rh_1rh	Rh-Hr
22	O M Rh_1Rh_1	O N Rh_0	O MN Rh_0	Rh-Hr
23	O MN Rh_0	O MN Rh_1Rh_1	(a) O MN Rh_1Rh_1	Rh-Hr
			(b) O MN Rh_1Rh_1	Rh-Hr
24	A_1 MN Rh_2rh	A_2B M Rh_2Rh_0	B M Rh_1Rh_1	Rh-Hr
25	A_2B N Rh_2rh	O MN Rh_1rh	O M rh	A-B-O and M-N
26	O M Rh_1rh	O MN rh′	A_2 N Rh_1rh	A-B-O and M-N
27	O M Rh_1rh	A_1 MN Rh_2Rh_0	A_1B N Rh_2	A-B-O and Rh-Hr
28	O MN Rh_0	O MN Rh_1rh	A_2 N Rh_2Rh_0	A-B-O and Rh-Hr
29	O N Rh_2rh	O N rh	(a) O N Rh_2rh	Not excluded
			(b) O MN Rh_1rh	M-N and Rh-Hr
30	O M Rh_1Rh_1	A_1 M Rh_1Rh_1	A_1 MN Rh_1rh	M-N and Rh-Hr

CASE 1.—A woman went to Florida while her husband remained in New York. About a year and a half later, she had a child, although she had at no time lived with her husband during that period. At the time of the child's birth, there was no dispute; in fact, the woman made a frank confession of the facts to her husband. When the child became about 3 years of age, the mother's friends prevailed on her to demand that her husband support the child. Blood tests failed to exclude the husband as a possible father of the child.

CASE 2.—A woman, about 40 years of age, almost immediately after her marriage to a wealthy man, about 65 years of age, told him she was pregnant. The husband was delighted. The obstetrician referred these two persons to me for examination of their blood, since examination for the Rh factor is now routinely carried out by almost all obstetricians. Both the prospective mother and her husband proved to be Rh negative. The obstetrician explained to the woman that she was fortunate and that there was no need for worry, because her baby would certainly be Rh negative and, therefore, could in no way be adversely affected because of Rh incompatibility. The following day the woman, evidently upset, insisted on seeing the obstetrician immediately and questioned him in regard to his statement that the child would with certainty be Rh negative. She wanted to know if there was any possibility that the infant might be Rh positive and whether it would be absolutely essential that the newborn baby's blood be examined and a record made of the report on the infant's chart. After being told that it would, she confessed that this child was not that of her husband but that of her lover whom she knew to be Rh positive. The obstetrician then had her return to me, and by arrangement, the blood of the father, who was then in Florida, was drawn by a local physician and sent to me by air mail. His blood proved Rh positive, but fortunately it was heterozygous. I explained to her that even though the father was Rh positive, since he was heterozygous, there was a 50-50 chance that her baby would be Rh negative. In that case the results of the examinations of her husband could not be used against her to exclude him as a possible father of the child. Actually, when the child was born, he proved Rh negative, and the husband, ignorant of the wife's deception, believed the child his own.

CASE 3.—Two men, one about 23 years of age and the other about 60, were admittedly intimate with the same woman. Each was aware of this. The woman became pregnant and gave birth to a child. The parties concerned consulted me, because they wished to know which one was the father. They agreed that if either one was excluded the other would marry the girl and give the child his name. The blood examinations failed to exclude either of the two men. Youth and romance prevailed. The woman married the younger, poorer man.

CASE 4.—The following interesting case is one that illustrates both the inability of blood tests to exclude paternity and also the lengths to which a man may go to prove his point. A married man wished to be divorced. Although he believed the child his wife had borne was his, he hoped that the contrary would be proved and, therefore, requested blood tests. He discussed his problem with a friend, who came up with the idea that since the husband believed that the child was his and the friend certainly had not sired this child, if the friend substituted for the husband and had his blood examined, there would be a better chance of obtaining results beneficial to the husband's case. Examination of the blood of the admittedly innocent friend failed to exclude him as the father. In the meantime, the husband was either smitten with a guilty conscience or wished a second opportunity to prove and confessed the deception to his attorney, who promptly got in touch with me and gave me the facts. It was agreed that this time the attorney would come in person to my office with the litigant and identify him. An examination of the husband's blood failed also to exclude him as the father. It is almost impossible to get all parties concerned together simultaneously for mutual identification, and it is possible that this deception has occurred in other cases. I resort to taking fingerprints of all parties as a means of identification. It must be recognized, however, that even with this safeguard, as illustrated in this case, substitution may be attempted. In this particular instance, it failed.

In this series, definite exclusion of the accused men was possible in 30 cases: in 8 by A-B-O factors alone, in 8 by M-N factors alone, in 8 by Rh-Hr factors alone, and in 6 by two of the three systems used. In two of these last six cases, paternity was disproved by A-B-O and M-N factors, in two by A-B-O and Rh-Hr factors, and in two

9. Wiener, A. S.; Gordon, E. B., Cohen, L.: A New Rare Rhesus Agglutinogen, Am. J. Human Genet. 4: 363-372, 1952.

by M-N and Rh-Hr factors (see the table). There were no triple exclusions. While in almost every case where indicated tests were made for the hr″ factor, in no case was it possible to base an exclusion on this factor. Case 19 in the table is interesting from a immunohematological standpoint, because the putative father belonged to type Rh_1Rh_1, which is rare, occurring less than once among 1,000 persons. In three cases in this study two children were involved and in one three children were involved. In one of the former cases, the husband was excluded as the father of the younger but not of the older child (case 29 in the table), and in another the husband was excluded as the father of the oldest but not of the two younger children (case 15 in the table). In two cases, the husband was excluded as the father of both children (cases 2 and 23 in the table). The following two cases are interesting examples of cases of exclusions.

CASE 5.—A young American soldier, who happened to be an attorney, fell in love with a young woman while stationed in Germany. He would gladly have married her, but at that time marriage was not permitted. He was transferred to the north, and subsequently, when he was to be shipped home, he asked to be routed through the town where the woman in question lived. When he arrived unexpectedly, he noticed a man's picture in her bedroom, but at the moment he disregarded it and only later did he realize its relevance. He remained with her one night and then went on his way to the United States. Almost nine months to the day after this last visit, the woman had a baby, to whom she gave the first name of the man whose picture had been seen in her bedroom. Yet the young man, without question, assumed that the child was his. As soon as the law permitted, he sent the woman funds and arranged that she and the child be brought to this country, where he married her. Quarrels, bickering, and unhappiness followed almost immediately. When the child was 3 years old, the mother taught him to say "Heil Hitler," and at this point the man moved out of his home. He took steps to have the marriage annulled, but even though he was an attorney he failed to have blood tests performed. He lost his case but still refused to live with or support his wife. As a result of her efforts to obtain money from him, he consulted an attorney, who referred him to me. The results of the blood grouping tests on the three persons involved were such that I was able to exclude the husband as the father of the child. The hr′ factor was the basis of the exclusion. The young man obtained a verdict in his favor. The number of cases recognized by the courts and based on the hr′ factor is few. This is one of them (case 18 in the table).

Various motives prompt the demand for blood tests. Usually, in my series, it was the desire of the husband to obtain a divorce and escape financial obligations. In other cases, the husband was convinced that his wife had been unfaithful to him, and he no longer wished to live with her. Even if the blood tests fail to exclude the husband as the father, the home probably is broken, because a marriage could hardly be expected to survive a husband's accusation that his wife has been unfaithful. In the following case, the motive was unusual.

CASE 6.—A woman frankly admitted that her child's father was not her husband but her husband's best friend. Both the husband and wife had interest in persons other than one another. The wife wished, however, to keep possession of the child who had been sired by her lover. On the other hand, the husband wished returned to him the house he had bought and had put in his wife's name at a time when they had been living together happily. This she refused to do. The husband then tried to use the child as a hostage, refusing to relinquish his right to the child unless the wife returned the house to him. The blood tests made at the wife's request excluded the husband as the father of the child. She kept both the child and the house (case 17 in the table).

COMMENT

The total number of disputed paternity cases irrespective of whether exclusion results is small in comparison to the number of mother, father, and child combinations in which tests are made to determine the possibility of the occurrence of erythroblastosis in a newborn infant. Obviously, in this latter group, which is large, paternity is not in dispute. A happy and joyous event is in the offing. In a group of several thousand such cases in which I have performed blood tests, the percentage of exclusions is virtually nil. In fact, this occurred in only one case, and the finding was accidental. This is the reason for the acceptance of the tests as evidence. As Wiener has pointed out, there are no exceptions to the rules of inheritance of these factors that cannot be explained by either error in technique or illegitimacy. In cases in which a dispute is involved, naturally the percentage of exclusions is considerably higher. The case in which exclusion of paternity was an accidental discovery was interesting.[11] The infant required a transfusion, and the laboratory had difficulty in finding a compatible donor. The case was then referred to me. It was found that the blood contained an anti-M agglutinin, although the child had received no previous transfusions or injections of blood. A naturally occurring anti-M factor is rare and unusual. Stimulated by scientific interest, I tried to obtain blood samples from the mother, father, and if possible, the grandparents. All members of the family except the mother of the child promptly responded. It was only after use of great pressure that she reported and permitted the drawing of a blood specimen. The fact that I was so insistent about getting the blood of the mother aroused suspicion in the mind of the grandmother. At first, she resented my persistence, but, suspecting that the tests were for paternity, she feigned indignation and surprise that I even suspected her daughter of being unfaithful to her husband; however, she soon admitted that she also had been suspicious. The test proved that the husband was not the father of the child. In most cases in this series, the man involved denied paternity. In 13 instances the child was born out of wedlock, while the remainder of the couples involved were married. In none of my cases was the maternity of the child questioned.

The psychological reaction of the mother at the time the tests are performed is interesting. It has varied from complete indifference to complete confidence in the outcome of the tests. At times the mother has shown righteous indignation as well as contempt for the man subjecting her and her child to what she considered an indignity. In cases in which exclusion of the accused man has been established, it might be expected that there would be some resentment directed toward the examining physician, but in my experience this has not occurred.

SUMMARY

The cell envelope of erythrocytes has various characteristics that can be identified by means of specific antiserums. These characteristics are inherited according to certain laws, and each parent makes an equal genetic contribution to the characteristics in the red blood cell envelope of the offspring. These characteristics establish

11. Unger, L. J.; Wiener, A. S., and Sonn, E. B.: Problems in Blood Grouping in Relation to Transfusion, Am. J. Clin. Path. **16**: 45-48, 1946.

at least nine independent blood group systems, resulting in more than 50,000 different varieties of blood. Thus, the complete blood grouping of a person may some day become as distinctive as his fingerprint. At the moment, for various reasons, only three blood group systems are made use of for medicolegal purposes, namely, the A-B-O, M-N, and Rh-Hr systems, and when they are simultaneously utilized, about 50% of men falsely accused of paternity can establish their innocence. Although these blood tests may exclude paternity, they can never prove it. Nevertheless, on occasion, even non-exclusion, although not proving paternity, has allayed a husband's suspicions and saved a marriage. In a series of 108 cases, 30 falsely accused men were excluded as fathers of the children involved in the dispute. The results were accepted as conclusive and largely determined the outcome in each case.

135 E. 74th St. (21).

SOFT TISSUE CALCIFICATIONS IN CORD LESIONS

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The interest in soft tissue calcifications in cord injuries arose after World War I when a number of wounded veterans exhibited that type of injury. Special hospitals for paraplegics were established. A great number of such patients were studied by a group of French neurologists, orthopedists, and pathologists. As a result of this study an interesting paper was published in 1919 by Mme. Déjerine [1] and her co-workers. This was a comprehensive study, and the French authors' observations and deductions as to the clinical, anatomic, and pathological aspects of the soft tissue calcifications in cord injuries still hold true and have served as a basis for later studies. This paper is the only one up-to-date that offers an extensive pathological study of 11 cases.

As described by the French authors, these calcifications show the following essential characteristics: 1. They always appear below the level of the cord lesion. 2. Their points of predilection are in the vicinity of the hip joint, the medial femoral condyle, and the knee joint; the joints proper are never involved; the calcifications may be single or multiple. 3. These calcifications appear early after injury, progress rapidly, and develop in areas where no previous hemorrhage or infection was observed. 4. The pathological anatomy studied in 11 cases showed grossly either compact bony nodules or a fine lacework of spongy bone along the diaphysis. At the hip joint a sort of bony scaffolding in three parts was observed—anterior, inferior, and sometimes posterosuperior, the bony bridging thus surrounding the capsule and, in certain cases, greatly interfering with the motion of the joint. Histologically, osteoblasts, cartilage cells, and adult bone were found; the trabeculae, often irregular in distribution and uneven in thickness, circumscribe medullary spaces containing normal blood-forming marrow cells.

Between the two world wars little was written on the subject of soft tissue calcifications in paraplegics. World War II brought a definite revival of interest in this problem, since a great number of paraplegics came under observation. Most of these patients are grouped in special services of the VA hospitals throughout the country. There they are studied and treated, with special consideration given to the possibilities of their rehabilitation. A number of papers dealing with the problem of soft tissue calcifications have come out of these VA hospitals.[2] In most of these recent papers the original description of Déjerine and her co-workers has been confirmed as to the frequency, date of appearance, distribution, and pathology of these lesions. Abramson [3] stressed again the early appearance of the soft tissue calcifications (as early as 20 days after injury); the same is true of urinary calculi, which occur with great frequency in these patients. The calcifications progress in size only to a certain point; they then become stabilized. In Abramson's series no connection between the site or the severity of the lesion and the location of the calcifications was found.

A total of 52 paraplegics or quadriplegics have been hospitalized up to date in the Chronically Ill Section of the State of Connecticut Veterans Home and Hospital. Nineteen showed partial paralysis and are not included in this study. Thirty-three patients had complete motor paralysis; in 3 cases no roentgenographic studies of the skeleton were available; thus, only 30 cases were studied. The paralysis of the upper extremities when present was never complete, while the paralysis of the lower limbs was total in all 30 cases. Tables 1 and 2 show the distribution according to etiology.

The post-traumatic cases top the list, making up almost 50% of the group with complete paralysis. Among the causes of injury, automobile accidents, diving accidents, and falls in construction work are predominant, in the order presented. Sixteen out of these 30 patients showed evidence of soft tissue calcifications. The distribution of calcifications was quite similar to that described in previous paper, though for some unknown reason no involvement of the knee joint region has been observed as yet. The appearance of these calcifications is quite striking and characteristic, as is illustrated by the roentgenograms (fig. 1 and 2). The hip regions were involved in nine cases, the pelvis in three cases, and the thigh and adductor areas each in two cases. Four patients showed calcifications in more than one area. Some of the cases show a very minimal degree of calcification; however, the appearance and location of calcifications in these mild cases place them in the same group.

It has been very difficult to study the approximate date of appearance of these calcifications in these patients.

From the Department of Radiology, State of Connecticut Veterans Home and Hospital.

1. Déjerine, Mme.; Ceillier, A., and Déjerine, Mlle. Y.: Para-ostéo-arthropathies des paraplégiques par lésion médullaire: étude anatomique et histologique, Rev. neurol., Par. **26**: 399-407, 1919.

2. Technical Bulletin TB 1 D-503, Veterans Administration, 1948

3. Abramson, A. S.: Bone Disturbances in Injuries to the Spinal Cord and Cauda Equina (Paraplegia): Their Prevention by Ambulation, J. Bone & Joint Surg. **30-A**: 982-987 (Oct.) 1948.

Most of them reached the hospital long after the start of motor paralysis. Thus, in 20 cases this time varied from 1 to 20 years, and in only 10 cases this period was below 1 year. Of these 10, calcifications were observed in 3 cases; urinary calculi, however, were present in 5 out of 10

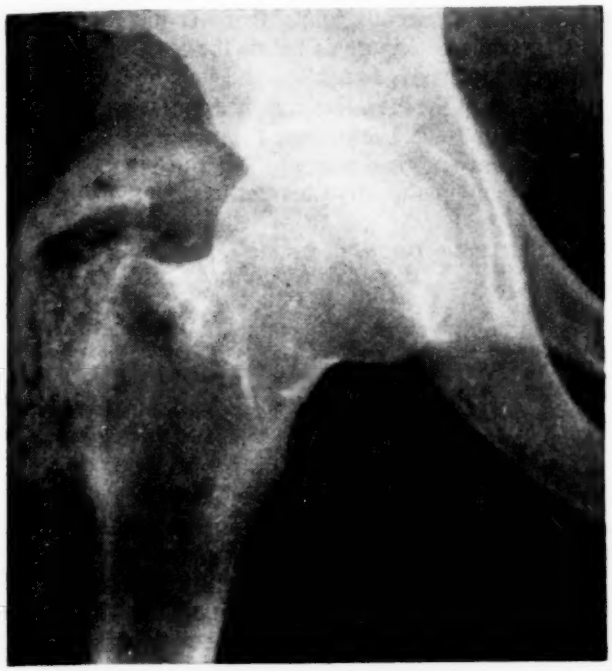

Fig. 1.—Roentgenogram of white man, aged 50, who had a compression fracture of the 10th thoracic vertebra; there was dense irregular calcification lateral to hip joint and along greater trochanter.

cases. Curiously enough one of the mildest cases was observed in a patient who had been paralyzed for 20 years. Table 3 shows the distribution according to etiology; in cases with soft tissue calcifications, calcifications

TABLE 1.—*Distribution According to Etiology*

	No. of Patients
Trauma	18
Poliomyelitis	8
Multiple sclerosis	6
Hemorrhage *	4
Syphilis	3
Fibrosis †	3
Cord tumors	3
Malignancy	2
Giant cell tumor	1
Degenerative disease	1
Tuberculosis of vertebra	1
Acute myelitis	1
Spina bifida ‡	1
Total	52

* Occurring from the 11th thoracic vertebra to the 3rd lumbar vertebra in one case and at the 12th thoracic vertebra in another.
† Two cases of arachnoiditis and one of gliosis.
‡ Occurring at the level of the fourth and fifth lumbar vertebrae and the first sacral vertebra.

were observed in 57% of the post-traumatic lesions. In passing it may be of interest to see that in the same group, with complete paralysis, urinary calculi occurred in 19 out of 30 cases (63.3%).

I was interested, as others before me, in the role played by the level of the cord lesion. For that purpose, only the post-traumatic lesions with a definite spinal cord level were considered; 15 such cases were studied (14 fractures, 1 gun shot wound). It appears that lesions in the cervical region are more consistently accompanied by soft tissue calcifications.

In the 16 cases in which soft tissue calcifications were found, fractures of the skeletal parts below the lesion were seen in 4 patients (table 4). As was mentioned by Abramson and others, these fractures occur after minimal trauma or without apparent trauma. Because of the extreme osteoporosis so frequently present, they can be

TABLE 2.—*Distribution According to Etiology in Patients with Complete Paralysis*

	No. of Patients
Fracture dislocation of the spine	13
Poliomyelitis	2
Hemorrhage	2
Cord tumors	3
Multiple sclerosis	2
Arachnoiditis	2
Acute myelitis	1
Malignancy	2
Giant cell tumor	1
Gliosis	1
Gun shot wound	1
Total	30

considered as pathological fractures. The loss of sensation below the level of the lesion prevents the patient from experiencing any pain. Swelling in the region of the fracture may be noticed several days later, or the fracture may be discovered much later as an incidental finding on a film taken for a different purpose. These fractures are

Fig. 2.—Roentgenogram of white man, aged 50, with compression fracture of the 10th thoracic vertebra; there was mesh work of calcified densities in soft tissue medial to lower third of femoral shaft, probably in the vastus medialis.

of interest because they often show an unusual reaction during the so-called healing period. There is an exuberant callus formation, exceeding greatly that seen in fractures

occurring in normal persons. In one of the cases a most unusual appearance was observed one month after a supracondylar fracture of the femur (fig. 3); the roentgenograms simulated to such a degree a subperiosteal hemorrhage that a tentative diagnosis of scurvy was

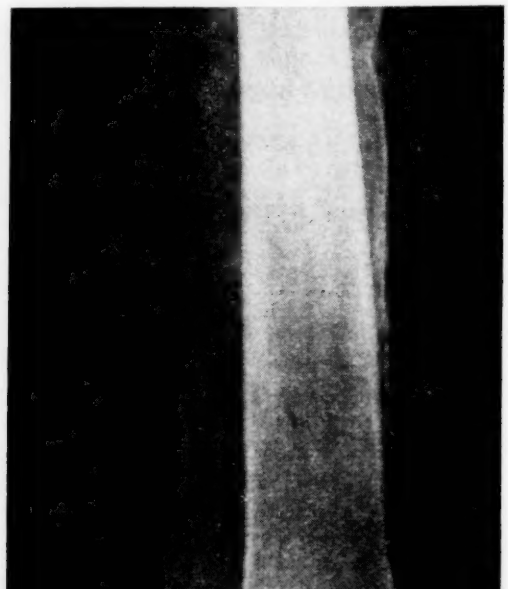

Fig. 3.—Roentgenogram of white boy, aged 19, with fracture dislocation of fifth cervical vertebra; appearance of the right knee and thigh after supracondylar fracture simulates a subperiosteal hemorrhage.

made. Unfortunately I was unable to perform the laboratory tests to confirm this diagnosis. Though the diet was not deficient in vitamin C, the patient was given large doses of ascorbic acid. Follow-up films, however, did

TABLE 3.—*Distribution According to Etiology in Patients with Soft Tissue Calcifications*

	No. of Cases	No. with Calcification
Fracture	14	8
Hemorrhage	1	1
Gliosis	1	1
Multiple sclerosis	1	1
Gun shot wound	1	1
Meningioma	1	1
Hodgkin's disease	1	1
Giant cell tumor	1	1
Arachnoiditis	1	1
Total	22	16

not show any regression of these calcifications, and one year later the appearance was that of solid bone. Recently this patient sustained a supracondylar fracture on the opposite side. Interestingly enough, he showed similar, though less extensive, soft tissue changes (fig. 4).

COMMENT

The soft tissue calcification in cord injuries can be differentiated from the much commoner post-traumatic myositis ossificans by the following factors: 1. Myositis ossificans develops after an injury. At a certain time the calcification reaches its maximum, and from then on it has a gradually regressive course. The differential diagnosis with neurotrophic arthropathies, known as Charcot's joints, is relatively easy, as the pathological bony process runs a parallel course to the disease itself; moreover in Charcot's joints there is increased bony density, while osteoporosis below the level of the transection of the cord is a constant and striking finding. The terminology in the literature is rather confusing, since the same lesions have been given the name of paraosteoarthropathies (original name in Déjerine's paper), ossifying fibromyopathy, myositis ossificans, myositis ossificans circumscripta neurotica, soft tissue calcification, and ossifications in cord lesions. The two latter are the least confusing.

TABLE 4.—*Distribution According to Level in Post-Traumatic Cases*

	No. of Cases	No. with Calcifications
Cervical region	7	6
Upper and mid dorsal	2	2
Lower dorsal	4	2
Lumbar	3	0
Total	16	10

The frequency of occurrence of these calcifications was found to be 48.7% by Déjerine.[1] Of 48 patients studied by Abramson,[3] 22 showed roentgenographic evidence of calcifications; Miller and O'Neill [4] found only 12 such cases in a group of 289 patients. I believe this low percentage is due to lack of routine x-ray studies of the skeleton rather than to the low incidence of such lesions; in the group of 30 cases of complete paraplegia,

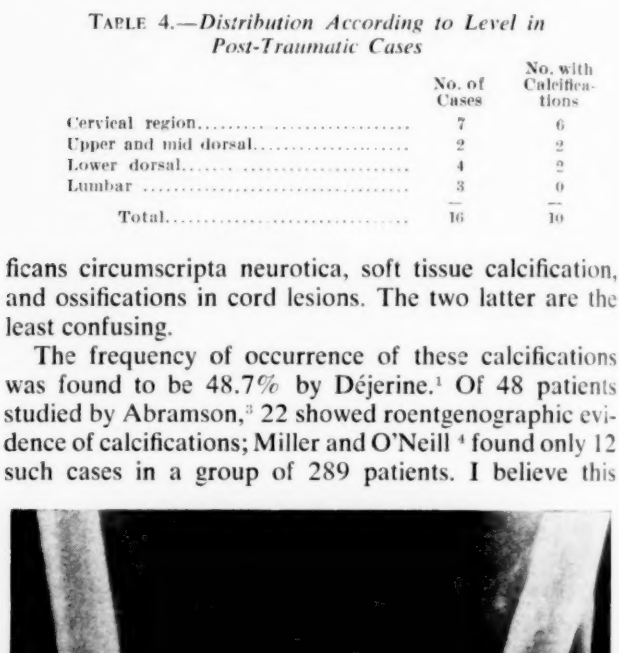

Fig. 4.—Roentgenogram of same patient as in figure 3 one year later; dense calcification of right knee and thigh is in the same area as in previous figure. In the left leg, after a more recent supracondylar fracture, a soft tissue calcification again simulating a subperiosteal hemorrhage is present.

4. Miller, L. F., and O'Neill, C. J.: Myositis Ossificans in Paraplegics, J. Bone & Joint Surg. **31-A**: 283-294 (April) 1949.

16 patients showed soft tissue calcifications, which represents 53.3%.

The mechanism underlying the formation of these calcifications has been of great interest to many. Extensive studies of blood chemistry have been rather deceptive, as they did not reveal significant deviation from normal serum calcium, phosphorus, and phosphatase values. Such changes are characteristically lacking in true osteoporosis, or bone atrophy. Déjerine and her coworkers thought that, in addition to periosteal bone formation, metaplasia was probably the process by which the primitive connective tissue was able to generate bone in the soft supportive tissue.

Geldmacher [5] thinks that tissue loses its character by trophic influence, reverting to an embryonic type. This embryonic tissue in the presence of hemorrhage, infection, and local increase in lime salts finds favorable conditions for the formation of such ossifications. This is suggestive of the opinion expressed by Déjerine. There is, however, a confusing discrepancy. The earlier pathological studies did not prove that either hemorrhage or infection precede the bone formation in these cases. But one cannot completely discard this view as far as excess bone formation around fracture sites in paraplegics is concerned.

The loss of bone density in motor paralysis is well known. The urinary output of calcium is found to be steadily increasing for a period of 30 days after injury, and it maintains a high level, probably as long as the function cannot be resumed (Abramson). The association of osteoporosis with soft tissue ossifications leads to the assumption that excessive calcium mobilization is one of the essential factors predisposing to ossifications, but other factors must exist, since the ossifications occur only in paralyzed parts of the body. They are never seen in disuse bone atrophy, senile osteoporosis, or other types of osteoporosis. The interruption of pathways in the spinal cord sets the stage for these abnormal calcifications. In normal persons as much or more calcium is being laid down in the bone as is being removed from the bone; in paraplegics more calcium is removed than is being laid down, owing to deficient matrix formation.

The level of the injury may have an influence on the formation of calcification as is suggested in these cases, though of course the series is too small to arrive at any conclusion. In cervical cord lesions, calcifications were found in six out of seven cases; in two cases of upper dorsal cord injury calcifications were present in both cases. Calcifications were found in two out of four lower dorsal cord lesions; in three cases of lumbar cord injury no calcifications were demonstrated. One can only speculate as to the possible mechanism on the basis of these findings; the fact that the sympathetic is not involved in the low dorsal and lumbar injuries may be of significance.

SUMMARY

Thirty cases of complete paraplegia were studied, and soft tissue calcifications were found in 53.3%. Urinary calculi were present in 63.3% of the cases. The lesions of the cervical cord were, in this series, more consistently accompanied by soft tissue calcifications, this being the case in six out of seven cases; in cases of lower dorsal cord lesions calcifications were found in two out of four; in three cases of lumbar cord injury no calcifications were present. Further investigation of soft tissue calcifications is suggested.

5. Geldmacher, cited by Miller and O'Neill.[4]

TREATMENT OF RHEUMATOID ARTHRITIS WITH AUROTHIOGLYCANIDE (LAURON)

Robert C. Batterman, M.D., New York

The discovery of cortisone and corticotropin (ACTH) raised considerable hope that the therapy for the rheumatoid state was at hand. An evaluation of the results, however, particularly after prolonged use, is indicative that there is much to be desired. Although the initial improvement is excellent in all but a few patients, the overall effectiveness is disappointing. When the results are analyzed in terms of the therapeutic criteria of the American Rheumatism Association,[1] functional improvement is very good but the degree of improvement in terms of rheumatoid activity is usually grade 2 (major) or 3 (minor) and rarely grade 1 (complete remission). In view of the high relapse rate, severe withdrawal syndrome, and toxicity with prolonged use, Freyberg and associates [2] have recently indicated that they are concerned with the question: "Will treatment with cortisone be worth while for this patient?" Therefore, the therapeutic measures available for the treatment of rheumatoid arthritis must be reevaluated, and those that over the years have been recognized to be the most effective should continue to be used. Prior to hormonal therapy, gold preparations were considered to be of greatest value by all but a few investigators.[3] The major criticisms raised against the use of gold therapy included (1) the slowness of onset of improvement, (2) the high incidence of patients not responding to initial treatment, (3) the low incidence of arrest of the rheumatoid process, and (4) the occurrence of toxicity, which might be serious in approximately 10% of the patients or fatal in approximately 0.5%. These criticisms are justified on the basis of knowledge available to that time; however, the history of any therapeutic agent or regimen reflects a fundamental principle that has been neglected for gold com-

From the arthritis services of Roosevelt and Metropolitan hospitals, and the Department of Medicine, New York Medical College.

1. Steinbrocker, O.; Traeger, C. H., and Batterman, R. C.: Therapeutic Criteria in Rheumatoid Arthritis, J. A. M. A. **140**: 659 (June 25) 1949.

2. Freyberg, R. H., and others: Problems of Prolonged Cortisone Treatment for Rheumatoid Arthritis: Further Investigations, J. A. M. A. **147**: 1538 (Dec. 15) 1951.

3. Rosenberg, E. F.: The Present Status of Gold Therapy for Rheumatoid Arthritis, Proc. Staff Meet., Mayo Clin. **17**: 264 (April 29) 1942. Short, C. L.; Beckman, W. W., and Bauer, W.: Medical Progress: Gold Therapy in Rheumatoid Arthritis, New England J. Med. **235**: 362 (Sept. 12) 1946. Steinbrocker, O.: Personal communication to the author.

pounds. This principle holds that any therapeutic measure indicative of merit, regardless of the likelihood of toxicity, stimulates further research to obtain medicaments with greater effectiveness and decreased toxicity. If a gold compound were to be developed with either one or both of these possibilities, the greater therapeutic range would extend the usefulness of gold therapy. In such a case, the only valid criticism to gold therapy would be the slowness of onset of improvement. The decreased toxicity would allow more extensive and prolonged treatment, thus decreasing the incidence of patients who previously did not respond and possibly increasing the number of patients that may have an arrest of the rheumatoid process.

This report presents my experiences over an eight year period with a gold compound, aurothioglycanide [4] (Lauron), which appears to decrease the criticisms of gold therapy. During this period, the formulation of the therapeutic criteria in rheumatoid arthritis played an important role in selection of patients for this investigation. The effectiveness of aurothioglycanide was analyzed according to these criteria. I was a member of the committee delegated to formulate these criteria, and, therefore, I know that this study was conducted with strict adherence to objective control from the moment that therapy was begun until the final analysis of the result. The patients selected for this investigation were chosen with particular care. It was felt that a well-controlled, small group of cooperative patients representative of each stage of the disease was of greater value than a large series of patients. The selected patients were observed for many months, and in some cases years, before gold therapy was begun. The possibility of spontaneous remission was thereby minimized. Furthermore, patients observed for such a period of time indicated their reliability for continued long-time study and follow-up.

SCOPE OF INVESTIGATION

Sixty-nine patients received aurothioglycanide. Thirteen of these patients had previously received another gold preparation, but only four of these patients did so under my supervision. Eight of the group previously treated were unable to continue using the gold compound because of toxicity. Aurothioglycanide was used in three dosage forms, 50, 100, and 150 mg. of the compound suspended in sesame oil. In a few of the early cases therapy was begun with an aqueous suspension. The initial dose varied between 25 and 100 mg., depending on the patient's status of arthritis or experience with previous gold therapy. If the disease was early and not too active, the initial dose was likeliest to be 25 mg. Also, if the patient had experienced toxicity previously to another gold compound, the initial dose for aurothioglycanide was 25 mg. The majority of patients began therapy with 50 mg. of the compound given intramuscularly at weekly intervals. The initial dose was given for at least three weekly injections. At the end of this period, if no improvement or toxicity occurred, the dosage was increased to the next level, 50 mg. in the case of the 25 mg. initial dose, or 100 mg. for the 50 mg. dose. This dose was then administered at weekly intervals. If at the end of 8 to 10 weeks no improvement or toxicity occurred, the dose was again increased. The status of the patient was thus reviewed at 8 to 10 week intervals and the dosage adjusted. The maximum dose administered to any patient never exceeded 150 mg. at weekly intervals. The majority of patients received 100 mg. as the maximum weekly dose. If at the end of approximately six months no improvement occurred, the gold injections were discontinued. In those patients who showed improvement during this period, the maximum weekly dose was continued until the improvement was well established and optimum for the patient's stage of arthritis. At the end of this period, the patients were divided into two groups. The first group of 25 patients had complete cessation of therapy, and they were observed at periodic intervals to note relapse or continuation of improvement. If relapse occurred, a second course of therapy was begun utilizing the same system as the initial course. Seven patients received an additional course with aurothioglycanide, and two patients subsequently received aurothioglucose.

The second group of patients received a maintenance dose of aurothioglycanide, from 50 to 150 mg. at two to four week intervals. Seventeen patients received this form of therapy. This was begun immediately after the initial therapy, which was terminated on an individual basis dependent on degree of improvement. In other words, none of the patients received a fixed amount of gold for the initial treatment. As soon as it was evident that improvement was sustained, the patient was transferred to a maintenance status, regardless of the amount of gold previously administered. Thus, some patients began maintenance therapy within a few weeks of initial therapy, while others required several months of weekly injections before maintenance therapy was begun. The dose usually used for maintenance was the maximum dose administered for the weekly injection.

The total duration of therapy varied between five weeks and three years. Approximately 75% of the patients received the preparation for more than 10 weeks, while approximately 50% of the patients were treated for 20 weeks or longer. Twelve patients were treated without interruption for over one year. This duration of therapy included the initial therapy as well as the period of maintenance of those patients receiving such therapy. The total amount of the gold compound administered, including the amount for initial therapy as well as the amount for maintenance, varied between 200 and 7,100 mg. Approximately 70% of the patients received more than 1,000 mg. Twenty-one per cent of the patients received more than 3,000 mg. Six patients received more than 5,000 mg. It is of interest to note that approximately 55% of the patients received 1,000 mg. or more for the initial therapy. Nine patients received more than 3,000 mg., and one of these was given 4,725 mg. In addition to the initial therapy, 17 patients received maintenance doses totaling between 425 and 5,700 mg. Seven of these patients received a total of more than 3,000 mg. of the preparation for maintenance.

4. Aurothioglycanide contains 54% gold, with the gold linked by means of a sulfur bridge to the organic portion of the molecule. The compound is available in sesame oil suspension, in a multiple dose vial with a concentration of 50 mg. and 150 mg. per cubic centimeter. Endo Products Inc., New York, supplied the material and other aid for this investigation.

RESULTS

Initial Therapy.—In regard to improvement in terms of rheumatoid activity, the patients were analyzed according to the therapeutic criteria [1] adopted by the American Rheumatism Association. The results should be considered as preliminary in nature, since insufficient time has elapsed to evaluate the question of recurrences or arrest of the rheumatoid process. At the termination of the weekly injections of the gold compound, 8 (11.6%) of the 69 patients manifested grade 1 (complete remission) improvement and 18 (26%) patients presented grade 2 (major) improvement. The other patients had either insignificant improvement or no effect on the rheumatoid activity. Thus, 37.7% of the patients had significant improvement. This analysis included all patients regardless of the stage of their disease or whether gold therapy was discontinued owing to toxicity. It is felt that in the latter cases patients should be included as a "no response," since therapy was not effectual. When one considers the response in terms of the stage of arthritis existing prior to therapy, it is apparent that a greater likelihood of improvement can be expected if the disease is treated early. Thus, of the eight patients with early, or stage 1, arthritis, four (50%) had complete remission and an additional two patients had major improvement, giving an over-all effectiveness of 75%. There were 17 patients with stage 2 arthritis; of these 4 (23.5%) had complete remission and 4 (23.5%) had major improvement, giving an effectiveness of 47%. With stage 3 and 4, none of the patients had complete remission. Nine (41%) of the 22 patients in stage 3 had major improvement, while only 3 (13.7%) of the 22 patients in stage 4 presented major improvement.

Maintenance Therapy.—The 17 patients treated with maintenance doses are of particular interest. These patients had an initial response and therefore continued therapy. Fifteen (88%) of these patients had a satisfactory end-result, with nine (41%) patients having a complete remission and eight (47%) patients having major improvement at the termination of maintenance. The two patients who failed to respond manifested increasing rheumatoid activity in spite of initial improvement and maintenance doses. Although there are too few cases for accurate statistical analysis, it is the impression that if the patient has stage 1 or 2 arthritis, the likelihood of achieving a good therapeutic response to therapy is excellent if the patient is able to tolerate the preparation and if therapy is continued as a maintenance procedure.

Improvement of Functional Capacity.—Improvement in terms of functional capacity is best considered in regard to the patient's original functional capacity. Thus, of the 17 patients in group 2, 8, or 47%, had complete restoration of function. Of the 27 patients in group 3, 5 (19%) had complete restoration and 12 (44%) improved into group 2. Of the 24 patients originally in group 4, functional improvement to group 2 occurred in 8 (33%) and to group 3 in 6 (25%). In general, improvement in functional capacity occurred in 41 (approximately 60%) of the 69 patients. All the patients on maintenance doses showed improvement in functional capacity. It is apparent that functional improvement is likelier to occur in patients treated with gold therapy than is reduction or abolition of rheumatoid activity.

Toxicity.—In analyzing the type and incidence of toxicity to aurothioglycanide, it is best to consider first those patients who had no toxicity to gold compounds used previously. Thus, 61 patients of the original group of 69 patients met this criterion. Toxicity of any degree or type was noted during the initial therapy in 15 of these patients, or 24.6%. The toxicity took the form of pruritis alone in three patients, an erythematous rash and pruritis in nine patients, an associated metallic taste in one patient, nausea and vomiting in one patient, and dermatitis exfoliata in two patients. One patient, with a mild rash, also noted edema of the face, leukopenia was discovered on blood cell count examination. In retrospect, the two patients with dermatitis exfoliata should not have had this severe reaction, since in both cases pruritis was noted prior to the rash; however, both cases were studied in the early period of knowledge of the drug.

The time of occurrence of the toxic manifestations reflect the relative safety of the preparation. Only six patients presented toxic symptoms or signs within 10 weeks of therapy. The earliest was five weeks after administration of 300 mg. of the drug. The longest period was for the patient in whom dermatitis exfoliata developed after 43 weeks of continuous therapy, or administration of 4,725 mg. of the drug. The others ranged from 11 to 28 weeks, with a dosage range of 400 to 2,350 mg. In addition to these 15 patients, toxic manifestations developed in 2 while on maintenance therapy. In one patient, after a total of 38 weeks of therapy, 2,200 mg., pruritis and a metallic taste developed. In the other patient an erythematous rash and metallic taste developed after 137 weeks of therapy, equivalent to 4,000 mg. In two additional patients toxic manifestations developed when a second course of the gold compound was administered. This occurred after 14 and 20 weeks, of 1,100 and 2,075 mg., respectively, administered in the second course. Thus, 19 out of 61 patients, or 31%, not having any previous toxicity to gold compounds, manifested toxicity to aurothioglycanide. The incidence may have been higher if more patients continued their initial therapy or received maintenance doses; however, this problem arises in any group of patients so studied, and it may be concluded that for the usual group of clinic and hospital patients treated with aurothioglycanide the incidence of toxicity is approximately 30%.

The duration of toxicity for the minor signs such as pruritis alone or mild erythematous eruption and pruritis was, as a rule, brief and never exceeded eight weeks. The majority of patients had complete subsidence of their complaints within two weeks of stopping gold therapy. In many cases, the toxic manifestations were transitory, being noted at one clinic visit and not being present at the next visit one week later. The only severe manifestation of dermatitis exfoliata existed for one year in one case and is still present for a period of more than two years in another. There was no correlation of the occurrence of toxicity with the age of the patient, stage of the disease, duration of arthritis, sex, race, or weekly dose. There was some indication that the duration of therapy may be a factor. Excluding the two patients in whom toxicity developed with maintenance doses, it was unusual to see toxicity after 15 weeks of continuous treat-

ment. Thus, in 73% of the patients in whom toxicity developed it did so before 15 weeks of therapy.

In the group of 69 patients treated with aurothioglycanide, there were 13 patients who had previously received another gold preparation. In eight of these patients toxicity had developed previously. When subsequently treated with aurothioglycanide toxicity occurred in five of these eight patients; however, in only one case was this toxicity severe. In this patient dermatitis exfoliata developed after 35 weekly injections of a total of 3,800 mg. The other patients noted mild pruritis and an erythematous rash, which lasted from one to eight weeks. In two patients this toxicity developed after four and five weeks of 150 and 300 mg. of gold. The other two required 12 and 34 weeks, or 1,000 and 2,550 mg., respectively. It is of interest to note that three of these eight patients could tolerate large doses of the gold compound without toxicity. An additional patient received an oily suspension of aurothioglucose (Solganal B oleosum) subsequent to aurothioglycanide, and toxicity developed to the former but not to aurothioglycanide. Thus four out of nine patients receiving both preparations could tolerate aurothioglycanide but not aurothioglucose.

Aurothioglucose.—Through the cooperation of Dr. Joseph Bunim, chief of the arthritis services, Third Medical Division (New York University), Bellevue Hospital, it was possible to obtain the records of a group of rheumatoid patients treated with aurothioglucose. These patients, in addition to those patients treated with this gold compound under my supervision, comprised a total group of 44 patients. Since the majority of these patients were observed by other physicians, a comparative control of the degree of improvement is not possible, and this aspect of treatment of this group will therefore not be presented. The data are pertinent only for the toxic manifestations. The 44 patients were treated according to a method similar to that in the aurothioglycanide group, except that maintenance doses were not given. The initial dose, as a rule, was 10 mg. given intramuscularly and at weekly intervals. This was increased until the patient was receiving 50 mg. as a maximum dose. The duration of treatment varied between 2 weeks, for two patients in whom toxicity developed within this period, and 76 weeks. The majority of patients were treated for 12 to 24 weeks. The total amount of aurothioglucose administered varied between 20 mg. (for the two patients in whom immediate toxicity developed) and 3,090 mg. Approximately 50% of the patients received 900 mg. or more.

Toxic manifestations were noted in 24 of these 44 patients, or an incidence of 54.5%. This occurred in from 2 weeks to 27 weeks of continuous therapy. As in the case of aurothioglycanide, in the majority, or 66%, of the patients in whom toxicity developed it did so before the 15th week of therapy; however, unlike this preparation, it did so before the 5th week in four patients. The amount of aurothioglucose administered at the time of toxicity varied from as little as 20 mg. to as much as 1,365 mg. In approximately 58% of the patients toxicity developed before 500 mg. of the drug was given. A comparative incidence for aurothioglycanide occurred at the 1,000 mg. mark.

The type of toxicity was also severer with 19 out of the 24 patients manifesting an erythematous eruption. Three patients manifested ulcerative stomatitis or buccal lesions. One patient had a severe anemia, and another purpuric manifestations. Another patient presented albuminuria. The duration of toxicity was also greater than that seen with aurothioglycanide. Although several patients had transitory signs, many patients had continuation of the eruption for several weeks and months.

COMMENT

The treatment of rheumatoid arthritis with gold compounds requires the application of fundamental principles universal for all forms of therapy. The first consideration is the disease itself. It is a progressive disorder that manifests itself by exudative phenomena of articular and extra-articular structures. The resultant pain, functional disability, joint destruction, and deformities challenge the efficacy of any therapeutic measure. The problem is twofold. The most important factor is to utilize "specific" agents to decrease, abolish, and prevent recurrences of the rheumatoid process or activity. Concomitant with specific medications, analgesics, sedatives, supportives, physical therapy, and orthopedic procedures as palliative and corrective measures could be utilized.

In regard to specific therapy, the efficacy of gold preparations has been the subject of considerable controversy. It would appear that the exudative process as a manifestation of rheumatoid activity may be decreased or abolished in many patients by the use of gold compounds; however, past experience with gold compounds has disclosed several facts pertaining to their use that require careful analysis. First, improvement in the rheumatoid process is slow to occur. Several weeks and occasionally months of continuous treatment are necessary before any significant improvement is manifested by the patient. This latent period is specific for the individual patient. The length of time required for its occurrence cannot be predicted in advance, nor can it be shortened by more frequent injections. On the contrary, the latter practice usually increases the likelihood of toxicity. From the patient's point of view, this latent period is most discouraging, since pain and disability are unchanged. From the physician's or investigator's point of view, the slow improvement cannot be distinguished from the natural remission that may occur. The results in any particular patient are therefore open to question; however, a statistical analysis of groups of rheumatoid patients is indicative that natural remission is not frequent and that with gold compounds this slow improvement is noted in the majority of patients.

Second, the degree of improvement is dependent on the stage of the disease. Gold therapy is most effective in the early phases before extensive joint destruction, deformities, and contractures are manifest. This lack of response to therapy for the advanced patient should be given due consideration in the final analysis of any treatment for any chronic disease. Lumping of results with inclusion of all stages of the disease is often misleading and the value of the therapy hidden by statistical implications. In the present study, approximately 60% of the patients were in stage 3 or 4 of their arthritis. The results, therefore, do not appear significant because the majority

of patients did not manifest grade 1 or 2 improvement; however, the results in the early stages of the disease leave no doubt that gold compounds are effective. It is claimed that the over-all effectiveness is no greater than what one would expect in a group of patients untreated for 10 years. What is not clarified is that these untreated patients may, at the end of 10 years, be free of the rheumatoid activity but at the expense of a crippling, deformed, usually bedridden state, whereas the treated group will have an arrest or major improvement of their disease relatively early in the treatment period so that further progression to the irreversible, crippled state is prevented.

One of the major criticisms raised against gold therapy is that with its cessation the majority of the patients will have a recurrence of the rheumatoid process. This observation was based on the results of the treatment of patients by courses of the drug. Recurrences have been eliminated by continuing therapy with maintenance doses. Not only the initial improvement will be sustained but also the likelihood of flare-ups of the rheumatoid activity occurring during and after therapy will be diminished.

The question of attaining a cure rather than an arrest of the rheumatoid process with gold compounds has still to be decided. The previous use of gold preparations by means of courses was unsatisfactory in this regard, but by continuous maintenance doses it may be possible to attain a cure in those patients in the early stages of their disease. This phase of treatment is still under investigation, but the results are more encouraging than heretofore. Once improvement is well established and maintained, it is exceedingly rare for such a patient to manifest progression of his disease.

The degree of improvement attained with maintenance therapy is dependent on the stage of the disease degree of rheumatoid activity, response during initial phase of treatment, and posology in the use of the gold compound. Experience with aurothioglycanide is indicative that with rare exception if the patient responds during the initial period of treatment this response will be progressive and sustained. The likelihood of its occurrence is greatest if the patient has stage 1 or 2 arthritis. The maintenance dose may have to be adjusted on an individual basis dependent on the completeness of response. Adjustment may be necessary in the size of the dose as well as intervals between injections. With stage 3 or 4 arthritis, the over-all response may be incomplete in that the patient continues to present exudative swelling, pain, and disability. It must be recognized that this response may be maximum for that patient and that complete remission cannot be attained; however, with maintenance doses it is possible to sustain the degree of improvement that has been achieved and thus in many instances keep the patient in a more comfortable state.

The toxicity of gold compounds has been the major disadvantage to their use. There is no question that the toxicity may be serious and even fatal, but it must be kept in mind that the reluctance of the medical profession to use gold preparations is based on the early formative years in their investigation. Not only were the original gold preparations more toxic than those available today but also insufficient knowledge was available to guide the physician in prophylactic measures or recognition of the early signs of toxicity that were not serious unless therapy was continued in spite of their presence. These two factors resulted in a very high incidence of serious toxicity in the early investigations. The more recent use of gold preparations has been relatively free of severe toxic manifestations except in the rare patient with an idiosyncrasy. Recognition of early signs, such as pruritis, any rash, metallic taste, or albuminuria, and discontinuation of therapy immediately with their occurrence has proved most satisfactory in avoiding serious toxicity. As a rule, therapy can be continued in many patients on this subsidence, but with the use of smaller doses.

Aurothioglycanide, in my experience, possesses the lowest potentiality for producing toxicity of any available gold preparations. This does not mean that toxicity cannot occur with its use. On the contrary, the same precautions are necessary in its use as with other gold compounds; however, the likelihood of serious toxicity is much less, and patients who cannot tolerate other gold compounds may continue therapy with aurothioglycanide. The question arises whether the insolubility of this gold preparation contributes to the lessened toxicity. It is conceivable that the intramuscular deposition of an insoluble gold compound might be less toxic because of delayed or lessened absorption; however, although absorption may not be complete, it does occur. The clinical response occurs at a time experience has taught us to expect with the use of soluble gold compounds. Furthermore, the occurrence of toxicity to this gold compound is itself evidence of absorption.

Many of the toxic manifestations seen with gold therapy may be the result of an idiosyncrasy rather than an actual cumulative gold intoxication. This is proved by the following factors: 1. Patients who manifest toxicity do so relatively early during the initial treatment period. Toxicity is most frequent before the 15th week of treatment and is uncommon thereafter. 2. It is unusual for the patient to present toxicity during the maintenance phase of therapy. 3. Patients previously treated with gold compounds who require additional therapy must begin cautiously with smaller than usual doses because of an increased likelihood of toxicity.

It is my belief that aurothioglycanide is not as toxic as other gold compounds because sensitization to its entire chemical moiety is less likely to develop. The lower incidence of toxicity with this gold preparation has thus increased the therapeutic range of this particular compound. It is for this reason that therapy could be continued for longer periods of time and achieve, if possible, a therapeutic result with prolonged therapy. The results with maintenance doses have been very satisfactory. The likelihood of attaining complete remission or arrest of the stage 1 or 2 rheumatic arthritis is now excellent as long as treatment in courses is avoided and maintained therapy instituted as soon as improvement is manifest.

CONCLUSIONS AND SUMMARY

The effectiveness and toxicity of aurothioglycanide were studied in a selected group of 69 patients with rheumatoid arthritis. Twenty-six patients (37.7%),

regardless of their stage of the disease, had a significant improvement with the initial phase of therapy. This, however, is misleading, since patients with advanced disease are less capable of response. Fifty-six per cent of the patients with early (stage 1 or 2) arthritis showed complete remission or major improvement at the termination of initial therapy. The initial response was further enhanced by maintenance therapy with aurothioglycanide, since 15 out of 17 (88%) patients so treated had a satisfactory end-result. Maintenance after initial improvement is the recommended method for gold therapy, since the likelihood of attaining complete remission or major improvement is excellent. The incidence, type, severity, and duration of toxic manifestations are indicative that aurothioglycanide is less toxic than other available gold preparations. The greater therapeutic range of aurothioglycanide removes, to a great extent, the major criticism against gold therapy, leaving the slowness of improvement as the only valid objection.

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PRELEUKEMIC ACUTE HUMAN LEUKEMIA

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During the past three years we have had the unusual opportunity to observe 12 patients for as long as 27 months prior to the development of acute myelogenous or stem cell leukemia. During the preleukemic phase, the transitional phase to acute leukemia, as well as thereafter until death, their clinical courses were recorded, frequent complete peripheral blood cell counts were made, and serial biopsies of the bone marrow and, in some cases, biopsies of liver and spleen were obtained.

Interest in the preleukemic phase of human acute leukemia has been heightened by recent studies in induced mouse leukemia. In both humans [1] and mice, the disease is usually rapidly fatal, with only short remissions sometimes produced by steroid or antifolic acid therapy. In the mouse, however, treatment with cortisone in the preleukemic phase of the disease has been shown to decrease the incidence of leukemia induced by x-ray [2] and possibly that induced by methylcholanthrene.[3]

This study is presented because it concerns the preleukemic phase of human acute leukemia, knowledge of which is at best fragmentary, and because studies on mouse leukemia have pointed to the possibility of a therapeutic approach to what is still a rapidly and uniformly fatal disease. This paper emphasizes the clinical course of various patients. In a companion publication, emphasis will be placed on the histogenesis of human acute leukemia.

It was sometimes difficult to determine the exact time at which a particular patient might be classified as being leukemic. One might object to a concept that differentiates a preleukemic from a leukemic phase in a patient who dies of leukemia on the grounds that the patient should be considered as having leukemia from the onset of symptoms clearly related to his final illness. As already mentioned, the recent studies on mouse leukemia point to a possible difference between what we choose to call the preleukemic and the leukemic phase.[4] Furthermore, there are clinical grounds on which this differentiation may be made. In the preleukemic phase, the characteristic enlargement of any of the hematopoietic tissues, except in two patients, was not demonstrable. In our experience, as well as in that of others, one may encounter middle-aged women with neutropenia,[5] other patients with refractory anemia [6] or thrombopenia,[7] and even those with large numbers of immature cells (including stem cells) in the peripheral blood,[8] in whom leukemia does not develop but who recover from or die of some other disease. Herz's patient [8a] had a white blood cell count of 24,000, with 55% stem cells, but leukemia did not develop. In addition, the histopathology of the bone marrow, liver, and spleen seen in our patients in the preleukemic phase is similar to that described in other conditions, namely neutropenia, purpura, and refractory anemia.[9]

Consequently, the diagnosis of acute myelogenous, or stem cell, leukemia has been made only at the time that the patients presented most of the classic criteria of acute leukemia, special attention being paid to the peripheral blood and especially to the hematopoietic tissues.

The presence of lymphadenopathy of even a slight degree, especially if combined with splenomegaly and hepatomegaly, has been considered important in making a diagnosis but, as will be seen, occurred quite late in the course of the disease. The demonstration of immature cells is of utmost importance but, as has already been shown, is far from pathognomonic of leukemia. Replacement of normal bone marrow elements by sheets of stem cells and promyelocytes has been the most important criterion selected to make a diagnosis of acute leukemia, since, even in the most intense leukemoid reaction, fairly large amounts of erythroblasts, megakaryocytes, and fat may be demonstrated. Similarly, a diagnosis may be made if foci of stem cells and early granulocytes are demonstrable in specimens of the liver and spleen.

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Dr. Arvid Johnston and Dr. A. R. K. Matthew of Rockford, Ill., aided in the follow-up studies of the patient in case 1 and Dr. Charles A. McClelland of Paris, Ill., in the follow-up studies of the patient in case 7. Dr. Cecil A. Warren of St. Paul, Minn., supplied the clinical records in case 10.

MATERIAL

Table 1 shows certain characteristics common to the 12 patients that were the basis for this study. All 12 were in the older age group, and 9 were postmenopausal women; the 10th woman had begun to complain of hot flushes. Various allergies were noted by six women. Each patient had as a major complaint at onset some symptom referable to a deficiency of bone marrow function, such as weakness and fatigue, infection, and a hemorrhagic phenomenon, singly or in combination. In all of the cases, except four in which the date of diagnosis of leukemia could not be set accurately and one (case 10) in which the diagnosis is still in doubt, the preleukemic phase was at least three times longer than the leukemic phase. Except for two cases and case 5, in which the leukemic phase lasted nine months, the patients' courses were extremely acute, almost explosive, once the leukemic phase became manifest.

Numerous biochemical determinations were obtained during the preleukemic phase, but, for the most part, they were normal or reflected temporary disturbances in fluid balance. Many of the patients had subclinical jaundice, but the jaundice was not a typical hemolytic type, with elevation of the indirect bilirubin. The patients in whom fecal urobilinogen determinations were obtained usually had an elevated hemolytic index even during periods when they were not jaundiced. The protein and albumin-globulin ratio was either normal or showed only a borderline elevation of the globulin and depression of the albumin.

TABLE 1.—*Clinical Data on Twelve Patients*

Patient	Age	Sex	Years Post-menopause	Allergic History	Onset	Duration of Disease (Mo.)		
						Total	Preleukemic	Leukemic
1	56	F	2	.....	Anemia	21	17	4
2	62	F	20	Vesicular rash	Anemia	19	17½	1½
3	47	F	Hot flushes	Drug	Neutropenia	8	7½	½
4	46	F	Menopausal	.....	Purpura	30	10-26	4-20
5	49	F	½	.....	Purpura	9 yr.? 36	27	9
6	54	F	16	Asthma	Neutropenia	11	10	1
7	44	F	7‡	Drug	Anemia and neutropenia	12	11	1
8	75	F	30‡	Urticaria	Neutropenia	2	2½	½
9	33	M	..	.....	Anemia	6	5	1
10*	57	F	6	Drug	Purpura	60	..	..
11†	61	M	..	.....	Anemia	6	5	1
12	58	F	7	.....	Neutropenia	12	11	1

* Patient is still alive but has not entered leukemic phase.
† Tuberculosis an additional complication.
‡ After hysterectomy.

REPORT OF CASES

CASE 1.—This 56-year-old widowed housewife was well until the development of diabetes in 1943. In July, 1948, she had a normal white blood cell count and hemoglobin level; in October, 1948, 17 months before a diagnosis of leukemia was made and 21 months before her death, an initial low hemoglobin level of 11.6 gm. per 100 cc. was found. By November, 1948, the hemoglobin level had dropped to 10.4 gm., but the white blood cell and differential counts were still normal. In February, 1949, she first began to complain of fatigue and vague abdominal pains. After that, progressive neutropenia and anemia developed, and the woman lost 15 lb. (6.8 kg.). She was admitted to the hospital on Aug. 2, 1949. There had been no known exposure to toxic agents. Physical examination on admission revealed nothing but mild diabetic retinopathy, a few petechiae on the legs, and a liver palpable 2 cm. below the costal margin. Hemoglobin level was 4.3 gm. per 100 cc.; platelets, 96,000 per cubic millimeter; reticulocytes, 1%; and white blood cells, 1,900 per cubic millimeter, with 78 neutrophils, 20 small lymphocytes, and 2 monocytes. Six erythroblasts per 100 white blood cells were present in the smear. Bleeding time was 4 minutes 30 seconds and clotting time 18 minutes. Sections of a bone marrow needle biopsy revealed a densely erythroblastic marrow with maturation arrest and marked decrease in the number of granulocyte precursors and neutrophils. A biopsy of the liver was normal except for a slight increase in iron in parenchyma cells. The patient was discharged with a diagnosis of primary refractory or acquired hemolytic anemia on Aug. 17, 1949, 10 months prior to her death and 6 months prior to the time a diagnosis of leukemia was made.

The progressive anemia was treated by blood transfusions. Two months prior to development of a leukemic state, the white blood cell count was 2,500, and occasional stem cells (myeloblasts and hemocytoblasts) began to appear in the peripheral blood. The diagnosis of acute leukemia was made in February, 1950, about four months prior to death. The liver and spleen were still not palpable, and the lymph nodes were not enlarged, but a marked hemorrhagic diathesis and pharyngitis had developed. X-ray therapy was given but did not change the course of the disease.

By May, 1950, the white blood cell count reached 35,000 and then 50,000 per cubic millimeter, with many myeloblasts and myelocytes. This was one month before death. Hepatomegaly, splenomegaly, generalized purpura, and nodular skin infiltrations developed. Shortly prior to the patient's death on June 6, 1950, the hemoglobin level was 8 gm. per 100 cc.; platelets, 27,000; and the leukocyte count, 208,000 per cubic millimeter, consisting only of stem cells and promyelocytes. At autopsy, the gross abnormalities were generalized purpura and subcutaneous nodules. The liver weighed 850 gm.; the spleen weighed 750 gm.; and numerous nodes 0.5 to 0.8 cm. in diameter were found. On microscopic examination, infiltration of the bone marrow, spleen, heart, lymph nodes, skin nodules, kidney, and adrenals by large stem cells was found.

CASE 2.—A 62-year-old housewife had had a vesicular skin rash for 20 years. In 1943 a duodenal ulcer developed. From 1948 until July, 1950, sporadic red and white blood cell counts, hemoglobin determinations, and differential counts were normal. At that time, 17½ months prior to the diagnosis of acute leukemia and 19 months prior to death, the hemoglobin level was 12.7 gm. and the red blood cell count was 3,800,000. Physical examination revealed nothing abnormal. By April, 1951, the hemoglobin level had dropped to 11.9 gm. per 100 cc.; the red blood cell count to 3,500,000; and the white blood cell count to 5,600 per cubic millimeter. From this time on there was progressive weakness. On Aug. 30, 1950, the hemoglobin level was 8.7 gm. and the red blood

cell count was 2,800,000, in spite of repeated transfusions. The white blood cell count was 2,250 per cubic millimeter, with a normal differential count, and there were 159,000 platelets and 7.4% reticulocytes. A bone marrow biopsy showed a marrow at the upper limit of normal cellularity (40% fat). The marrow was primarily erythroblastic, with many erythroblasts in mitosis, and there was maturation arrest of the granulocytes so that only rarely were any adult neutrophils seen. Stem cells were slightly but significantly more numerous than normal. Iron granulation was excessive. In view of the patient's claim that she had been jaundiced, a diagnosis of acquired hemolytic anemia was considered. Because of neutropenia and bone marrow findings, toxic agranulocytosis was also considered.

Anemia continued intractable, malaise and anorexia developed, and, in November, 1951, marked purpura was first noted. On physical examination there was no lymphadenopathy, hepatomegaly, or splenomegaly, but a single ecchymosis was found. Smears of a bone marrow aspiration on Nov. 5, 1951, were extremely cellular and were composed of over 50% stem cells. The hemoglobin level was 9.9 gm. (after transfusions); platelets, 57,000; reticulocytes, 0.3%; and there was leukopenia, 2,500 white blood cells, with a differential count of 2 neutrophils, 66 small lymphocytes, 1 monocyte, 26 myeloblasts, 1 myelocyte, 4 metamyelocytes, and 1 erythroblast. Since the diagnosis of acute leukemia was unequivocal, administration of corticotropin (ACTH) was begun on Nov. 20, 1951, but had to be stopped because of a psychosis. Thereafter, in spite of intermittent cortisone therapy, the hemorrhagic tendency became worse, fever continued at 40 C, and anemia was not alleviated by transfusions. Jaundice, extreme purpura, and shotty lymphadenopathy developed, but there was no splenomegaly or hepatomegaly. The patient died on Dec. 10, 1951, one and one-half months after the diagnosis had been made and 19 months after the start of the preleukemic phase. Permission for autopsy was refused.

Case 3.—The patient was in good health until generalized pains and nervousness developed in December, 1948. In April, 1949, the woman was treated for amebiasis and all through 1949 received a wide variety of medicaments for mild joint and abdominal pains. In September, 1949, an erythematous rash developed on her shoulders and legs. She had lost 50 lb. (22.7 kg.) by the time she was first seen on Jan. 16, 1950, seven and one-half months prior to the diagnosis of acute leukemia and eight months prior to death.

Physical examination at that time revealed nothing except a few petechiae and ecchymoses and positive evidence of the Rumpel-Leede phenomenon. Hemoglobin level was 13.5 gm. per 100 cc.; red blood cell count, 4,100,000; platelets, 195,800; reticulocytes, 1.4%; and white blood cell count, 900 per cubic millimeter, with a differential count of 21 neutrophils, 2 eosinophils, 71 small lymphocytes, and 6 monocytes. At the end of January, 1950, acute thyroiditis developed with a rise in the white blood cell count to 2,400, with only 14 neutrophils, 81 small lymphocytes, 2 eosinophils, 3 monocytes, and 5 erythroblasts. The hemoglobin level was 13 gm.; platelets, 201,000; and reticulocytes 2.2%. Bone marrow on Feb. 8, 1950, showed hyperplasia of granulocyte precursors but a normal number of erythroblasts and megakaryocytes. An epinephrine test was performed, and the leukocyte count rose from 1,800 to 5,000 per cubic millimeter; the platelets were unchanged after 30 minutes. Diagnosis of bromidism, acute thyroiditis, and hypersplenism was made. Toxic neutropenia and early acute leukemia were considered improbable.

Between February and the beginning of August, 1950, three blood cell counts showed no significant change. The patient continued to feel well. During the first week of August, gingivitis, stomatitis, and pharyngitis developed. Physical examination revealed only ulcerative pharyngitis and petechiae and ecchymoses on the woman's legs. Hemoglobin level was 9 gm.; red blood cell count, 3,200,000; platelets, 77,000; reticulocytes, 1.1%; and white blood cell count, 1,250, with a differential count of 1 neutrophil, 1 eosinophil, 80 small lymphocytes, and 18 myelocytes. On Aug. 23, 1950, the bone marrow had a normal number of erythroblasts, stem cells were increased, and there was maturation arrest and hyperplasia of granulocyte precursors. The patient was treated with aureomycin, but right lower lobe pneumonitis developed. Hypersplenism was still thought to be the most logical diagnosis.

On Sept. 1, 1950, surgical biopsy of the sternum was obtained. The marrow was almost solidly cellular. There were solid sheets of stem cells, with occasional promyelocytes; neutrophils were extremely rare; erythroblasts were moderately decreased; and megakaryocytes were numerous. The spleen was first palpated on that day.

Because of increasing toxicity, purpura, and pneumonitis the patient underwent an emergency splenectomy on Sept. 3, 1950, 13 days before death, with a diagnosis of hypersplenism, although early acute leukemia was considered. Sections of the spleen showed hyperplasia of lymphatic nodules composed of medium to large lymphocytes. Occasional stem cells were seen in the red pulp. A biopsy of the liver revealed an increase in the number of large and small lymphocytes in the portal areas.

On Sept. 5, 1950, the hemoglobin level was 14.4 gm. (after massive transfusions); red blood cell count, 5,000,000; platelets, 86,900; and white blood cell count, 1,640 per cubic millimeter, with a differential count of 1 neutrophil, 1 eosinophil, 10 small lymphocytes, 83 myeloblasts, 5 promyelocytes, and 89 erythroblasts. Giant platelets were seen. The leukocyte count rose to 6,500 per cubic millimeter but consisted almost solely of stem cells and promyelocytes and only occasional erythroblasts. Marked purpura and increasing jaundice developed, and the patient died on Sept. 16, 1950, in spite of treatment with corticotropin and cortisone.

The gross findings at autopsy were marked jaundice, generalized hemorrhages, and decubitus ulcers. The liver weighed 2,200 gm., but there was no significant lymphadenopathy. The marrow was extremely cellular and contained sheets of myeloblasts and promyelocytes, with occasional erythroblasts and adequate megakaryocytes. Microscopically, the liver was similar to the specimen obtained at operation. No other evidence of leukemia was noted.

Case 4.—This 46-year-old woman first noted menorrhagia and metrorrhagia in January, 1949, 30 months before she died and 10 to 26 months before we made the diagnosis of acute leukemia. Generalized purpura developed in September, 1949, and a diagnosis of thrombocytopenic purpura was considered. Findings on physical examination in October, 1949, were normal except for pallor, ecchymoses, and purpura, but the Rumpel-Leede phenomenon was absent. Blood cell studies indicated 8.3 gm. of hemoglobin; 3,300,000 red blood cells; and 11,300 white blood cells, with a differential count of 41 neutrophils, 34 small lymphocytes, 16 myeloblasts, 4 myelocytes, and 5 metamyelocytes. Sections of bone marrow aspirated on Oct. 20, 1949, revealed a solidly cellular marrow, with extreme hyperplasia of the granulocytic and erythroblastic lineages but only slight maturation arrest in the former. Stem cells and mitotic cells were not numerous. No diagnosis was made. Although subacute myelogenous leukemia and hypersplenism were considered, it was felt that the erythroblastic hyperplasia was too intense to warrant the former diagnosis. Splenectomy was seriously considered.

X-ray sterilization was completed in November, 1949, because of uncontrollable vaginal hemorrhage. At that time, the platelet count was 133,000 per cubic millimeter. The presence of 8.7% reticulocytes and 5 erythroblasts was thought to contradict the diagnosis of acute or subacute leukemia. The only new finding was swollen submaxillary glands probably related to hemorrhagic gingivitis. Because of the latter, the patient received x-ray therapy to the gums in January and February, 1950, with only negligible benefit.

She continued to experience frequent hemorrhages, and, on Jan. 6, 1950, another marrow specimen was similar to the first, but 10 days later a specimen contained fewer erythroblasts. Findings on physical examination were normal except for an extreme, generalized hemorrhagic tendency. Bleeding and an intermittent fever continued in spite of antibiotics, toluidine blue, and local absorbable gelatin sponge (Gelfoam). The hemoglobin level was 7.9 gm. per 100 cc., and red blood cell count was 2,700,000 in spite of repeated transfusions. There were 81,120 platelets, and the white blood cell count had risen to 14,000 per cubic millimeter, with 50 neutrophils,

6 medium lymphocytes, 30 small lymphocytes, 1 eosinophil, 5 myeloblasts, 4 myelocytes, 4 metamyelocytes, and 5 erythroblasts.

The marrow on Feb. 14, 1950, was still solidly cellular but contained more adult neutrophils and showed at least adequate erythropoiesis and megakaryocytopoiesis. The white blood cell count was 25,300, with 37 neutrophils, 9 lymphocytes, and 16 stem cells, 4 promyelocytes, 18 myelocytes, 14 metamyelocytes, 2 stab cells, and 5 erythroblasts. There were 55,000 platelets per cubic millimeter. The diagnosis of subacute myelogenous leukemia was considered seriously but not accepted because of the marked erythropoietic activity of the marrow as well as the complete lack of lymphadenopathy, splenomegaly, or hepatomegaly.

In March, 1950, extraction of all of the patient's teeth resulted in extreme hemorrhage and gingival hyperplasia. Repeated blood cell counts were unchanged. In April, 1950, 17 months prior to death, the gingival hyperplasia was so extreme that it was felt that subacute myelogenous leukemia was the most likely diagnosis. The gingival hyperplasia responded dramatically to administration of corticotropin, and there was some improvement in the hemorrhagic tendency.

The patient's course was marked by exacerbation and remission of the hemorrhagic diathesis, with partial control by steroidal therapy and a white blood cell count that varied from 3,000 to 50,000 per cubic millimeter, with as many as 16 erythroblasts in the peripheral blood. Minimal and questionably significant lymphadenopathy was first detected in November, 1950, 10 months before death. Definite abnormalities, such as lymphadenopathy, hepatomegaly, and splenomegaly, were first noted in May, 1951, only four months before the woman died. A bone marrow biopsy specimen obtained at that time was inadvertently lost.

The patient died on Sept. 9, 1951. Postmortem examination was limited to needle biopsy of the liver, spleen, and bone marrow and to excision of a supraclavicular node. All specimens showed marked infiltration with many stem cells and some promyelocytes. Rarely, a few erythroblasts and megakaryocytes were found in the marrow. The marrow was completely unlike that obtained at the previous biopsy on Feb. 14, 1950, when the diagnosis of subacute myelogenous leukemia was rejected primarily because of the marrow histopathology.

Because of the lack of tissue studies, it is hard to fix the date of development of an unequivocal leukemic state, but this probably occurred between February, 1950, 20 months prior to death when there was a white blood cell count of 25,000 per cubic millimeter, with 52% immature cells and 55,000 platelets, and May, 1951, 4 months before death, when lymphadenopathy, splenomegaly, and hepatomegaly were noted.

CASE 5.—This emotionally unstable 50-year-old woman noted that she began to bruise easily in 1941, 9 years before death. Marked exacerbation of this symptom occurred in 1947, three years before her death and two years before diagnosis of subacute leukemia was made. By March, 1947, menorrhagia required 20 pads for each period. Physical examination on July 1, 1947, revealed only marked purpura. The Rumpel-Leede phenomenon was not present. Hemoglobin level was 13.8 gm. per 100 cc.; erythrocyte count, 3,800,000; reticulocytes, 0.1%; and white blood cell count, 5,800 per cubic millimeter, with a normal differential count. Bleeding and clotting times and a bone marrow specimen were normal. A diagnosis of vascular (nonthrombocytopenic) purpura was made. In March, 1948, the patient was given a blood transfusion at another hospital because of hemorrhage that followed dental extraction.

She was seen three times in May, 1948, complaining of pain in her knees after a course of shock therapy. Results of a physical examination were unchanged except for evidence of fluid in the right knee joint. The Rumpel-Leede phenomenon was still absent. Peripheral blood cell counts showed 9 gm. of hemoglobin, 3,100,000 red blood cells, 203,000 platelets, and 4,700 white blood cells, with 30 neutrophils, 64 small lymphocytes and 6 monocytes. Bleeding and clotting times were normal. The marrow was still normal, with a possible hyperplasia of immature granulocytes that was not intense enough to even warrant a diagnosis of a leukemoid reaction. No new diagnosis was made.

In October, 1949, the woman returned because of severe menorrhagia, metrorrhagia, epistaxis, and melena. Physical examination again revealed nothing abnormal. There were 26,000 white blood cells, 7.9 gm. of hemoglobin, 1,700,000 red blood cells, 7.6% reticulocytes, 48,000 platelets, and a differential count of 7 neutrophils, 61 small lymphocytes, 21 stem cells, 4 promyelocytes, 4 metamyelocytes, and 3 erythroblasts. The bone marrow was indicative of subacute myelogenous leukemia. The diagnosis was, therefore, made 9 months before the patient died and 27 months after a flare up of a hemorrhagic process that had already existed for nine years. Splenomegaly and hepatomegaly were first detected in March, 1950, only four months prior to death and five months after the diagnosis of subacute leukemia was made. Her course was steadily downhill in spite of radiophosphorus therapy and supportive measures. She died in July, 1950.

At autopsy multiple ecchymoses and petechiae, generalized lymphadenopathy, and splenomegaly were seen. There was leukemic infiltration of the bone marrow, liver, spleen, lymph nodes, heart, stomach, urinary bladder, thyroid gland, uterus, and, to a lesser extent, the kidney. These tissues were indicative of acute to subacute myelogenous leukemia on microscopic study.

CASE 6.—A 54-year-old woman had had asthma for 27 years. In 1935, she underwent hysterectomy. In July, 1947, she had pneumonia that was treated without complication with penicillin and sulfadiazine. The hemoglobin level and red blood cell count were normal, and there was a leukocytosis, 15,720 white blood cells per cubic milliliter, with 91% neutrophils. She was hospitalized in March, 1948, for an acute asthmatic attack and possible bromide intoxication. Physical examination showed nothing abnormal except for evidence of asthma. Hemoglobin level, red and white blood cell counts, and differential count were normal.

By April, 1950, 11 months before death and 10 months prior to the time a definite diagnosis was made, a white blood cell count of 3,600 per cubic millimeter, hemoglobin level of 13.1 gm. per 100 cc., and a red blood cell count of 4,200,000 were recorded. The patient continued to feel well until she noted epistaxis early in December, 1950. By the end of that month, she experienced weight loss, generalized bleeding tendency, continuous fever, and weakness. The findings of physical examination on Feb. 3, 1951, were normal except for ecchymoses. There were 9 gm. of hemoglobin, 2,600,000 red blood cells, 23,100 platelets, and 450 white blood cells. The differential count showed 7 neutrophils, 59 small lymphocytes, 1 monocyte, 4 myelocytes, 29 stem cells, and 9 erythroblasts. The marrow obtained on Feb. 5, 1951, one month before death, was fatty with only occasional stem cells and promyelocytes. A diagnosis of toxic aplasia or aplastic anemia was considered, with early acute leukemia a possibility.

The patient continued a downhill course with repeated chills and fever, progressive hemorrhagic tendency, and, in spite of frequent transfusions, progressive anemia. The white blood cell count varied between 2,000 and 400 per cubic millimeter, with between 37 and 52 stem cells. The platelet count gradually dropped to 13,200. On Feb. 12, 1951, a surgical biopsy of sternal marrow revealed a solidly cellular marrow composed almost exclusively of sheets of stem cells. The diagnosis of acute leukemia was made 21 days before the patient died of an intracranial hemorrhage on March 2, 1951. Autopsy was not performed.

CASE 7.—This 44-year-old woman was a bookkeeper. She had been sensitive to procaine hydrochloride and had allergic rhinitis. In 1946, she had a hysterectomy. In September, 1950, she had a febrile illness of unknown nature and was told that she was anemic at that time. In December, 1950, 12 months before she died and 11 months before a diagnosis was made, she quit work because of weakness and, in January, 1951, was hospitalized because of ear pain. She was treated with transfusions, liver, and iron.

On Feb. 28, 1951, she was admitted to another institution because of weakness, fever, generalized pains, weight loss of

12 lb. (5.4 kg.), and the development of purpura. Physical examination revealed nothing abnormal except purpura and petechiae. Red blood cell count was 2,600,000 per cubic millimeter; hemoglobin, 8.7 gm. per 100 cc.; and white blood cell count, 5,800, with 55 neutrophils, 2 eosinophils, 40 lymphocytes, and 3 monocytes. On March 6, 1951, the white blood cell count was 17,400 per cubic millimeter, with 1 stem cell, 1 myelocyte, 86 neutrophils, 8 lymphocytes, and 4 monocytes. On March 16, the white blood cell count had dropped to 2,900, with 47 neutrophils, 8 stem cells, 45 lymphocytes, and 2 monocytes. By March 24, after treatment including transfusions, penicillin, and chloramphenicol (Chloromycetin), the hemoglobin level reached 13.3 gm. per 100 cc., and the white blood cell count was 4,050, with a normal differential count. The patient was discharged on March 24, 1951, and readmitted three days later with abdominal and joint pains, chills, and fever. A left pleural effusion was demonstrated roentgenographically. The woman was treated with transfusions intermittently until July, 1951, four months prior to death. At that time the liver and spleen were questionably palpable.

She was admitted here on July 9, 1951, after an attack of purulent acute sinusitis. Physical examination revealed an acutely ill, obese woman with marked generalized purpura. The liver and spleen were not palpable. The hemoglobin level was 7.8 gm.; red blood cell count, 2,710,000; white blood cell count, 3,850; platelets, 18,700; and reticulocytes, 14%. The differential count included 67 neutrophils, 24 small lymphocytes, 6 monocytes, 1 stem cell, 1 myelocyte, and 1 metamyelocyte, with 13 erythroblasts. Surgical biopsy showed extreme erythroblastic hyperplasia in a solidly cellular marrow. Splenectomy was performed because of a diagnosis of acute hypersplenism (hemolytic anemia and thrombopenia). The spleen showed red pulp hyperplasia and was twice the normal size.

After splenectomy and transfusions, the hemoglobin level dropped to 9.5 gm.; the white blood cell count from 13,000 to 6,000 per cubic millimeter; and platelets rose from 42,900 to 112,000 within 12 days. Reticulocytes averaged 1.5%, and there were no immature cells in the peripheral blood during this period. The patient was discharged on Aug. 2, 1951, and rehospitalized in her hometown on Sept. 4, 1951, with fever, pain, and weakness. There was an intermittent pericardial friction rub but no lymphadenopathy, and the liver was never palpable more than one cubic centimeter below the costal margin. She received transfusions, but her course was steadily downhill. On Sept. 9, the white blood cell count was 9,600; hemoglobin, 9 gm.; red blood cell count, 3,300,000; reticulocytes, 6.9%; and platelets, 108,000. The differential count included 68 neutrophils, 29 small lymphocytes, and 3 monocytes. By Sept. 24, the white blood cell count had risen to 37,050, with a differential count of 87 neutrophils, 11 lymphocytes, 2 monocytes, and 24 erythroblasts. On Oct. 2, the differential count showed four stem cells. A diagnosis of acute myelogenous leukemia was made on Nov. 5 when the leukocyte count reached 148,000 per cubic millimeter, with 8 myeloblasts, 7 myelocytes, 21 lymphocytes, 7 monocytes, and 54 neutrophils. During the last month of the patient's life, there continued to be immature granulocytes in the blood. The patient died at the end of November, 1951. An autopsy was not done.

Case 8.—A 75-year-old woman noted a vesicular pruritic rash and urticaria in August, 1949, one year prior to death. She noted some resolution after administration of diphenhydramine (Benadryl) hydrochloride and menthol-phenol paste. In April, 1950, she was hospitalized for treatment of the skin rash with diethylstilbestrol (Stilbestrol), calcium, ichthammol (Icthyol), and penicillin. She received soft skin x-ray therapy in May and July, 1950. The hemoglobin level and erythrocyte, leukocyte, and differential counts were normal until July 10, 1950, three months before she died. At that time, 2,700 leukocytes and a normal hemoglobin level and differential count were noted. The white blood cell count and percentage of neutrophils dropped thereafter. By Aug. 23, 1950, the hemoglobin level was 10 gm. per 100 cc.; platelets, 66,000; and white blood cell count, 1,000 per cubic millimeter, with 36 neutrophils, 56 small lymphocytes, and 6 monocytes. Physical examination showed nothing abnormal except a few petechiae and a blotchy red rash. A bone marrow specimen on Aug. 23, 1950, 16 days before death, was almost completely aplastic; only an occasional stem cell and promyelocyte were found. There was no histological evidence of leukemia.

On Aug. 28, the leukocyte count had reached 600, with a differential count of 17 neutrophils, 68 small lymphocytes, 9 monocytes, 4 basophils, 2 myelocytes, and 2 erythroblasts. The marrow contained an adequate number of erythroblasts and a few islands of granulocyte precursors; it contained 80% fat. On Aug. 31, the leukocyte count had risen to 1,150 with 21% stem cells, the only immature cells in the smear. In spite of the absence of lymphadenopathy or splenomegaly, the diagnosis of acute leukemia was considered six days before the patient's death.

She continued to feel well and physical examination revealed only dermal evidence of a hemorrhagic tendency. The hemoglobin level was maintained at 12 gm. per 100 cc. by repeated transfusions. The patient was discharged on Sept. 5, 1950, although the white blood cell count had risen to 14,150, the platelets had dropped to 27,300, and the differential count showed 93 myeloblasts, 6 small lymphocytes, 1 myelocyte, and 2 erythroblasts. The patient returned to the hospital three days later and, on physical examination, was found to be acutely ill with a temperature of 104.5 F (40.3 C). Her body was covered with petechiae and purpura. Some small, shotty cervical nodes were found. The peripheral blood counts were 12.7 gm. of hemoglobin (after a transfusion); 74,500 white blood cells; 29,700 platelets; 0.5% reticulocytes; and a differential count of 88 stem cells, 8 promyelocytes, 2 myelocytes, and 2 metamyelocytes. The bone marrow was composed almost exclusively of sheets of stem cells, and the diagnosis of acute leukemia was considered unequivocal.

The patient died on the day of admission. At autopsy, a diffuse hemorrhagic process was seen. The liver was enlarged to several centimeters below the costal margin and weighed 1,000 gm. The spleen weighed 420 gm. The marrow was pale yellow to yellow-brown in color. There was no unusual lymphadenopathy. Microscopic examination showed leukemic replacement in the bone marrow, spleen, liver, and one lymph node.

Case 9.—A 33-year-old streetcar motorman had noticed weakness since March, 1950, five months before a definitive diagnosis was made and six months before he died. In April, he received three transfusions. His history included an attack of anemia and splenomegaly, with spontaneous remission at the age of 14. He had lost 10 lb. (4.5 kg.) in two years and was a moderately heavy drinker. Physical examination on April 26, 1950, revealed a pale man with a firm, nontender spleen that could be palpated 3 cm. below the costal margin. There was no clinical evidence of a hemorrhagic tendency. The hemoglobin level was 5.7 gm. per 100 cc.; white blood cell count, 850; platelets, 62,700 per cubic millimeter; reticulocytes, 0.1%; and a differential count of 13 neutrophils, 85 small lymphocytes, 1 monocyte, and 1 metamyelocyte. On microscopic section, the bone marrow was solidly cellular because of extreme erythroblastic hyperplasia, hyperplasia of immature granulocytes, and slight increase in stem cells; it contained a large amount of iron. A diagnosis of hypersplenism was made in spite of the low reticulocyte count. Leukemia was considered. The patient was given a transfusion and discharged on May 11, 1950.

On May 26, he was readmitted because of progressive anemia. Essentially the same physical findings were present except for a few small right axillary nodes. Blood chemistry studies showed 7.5 gm. of hemoglobin; 1,750 white blood cells; 135,500 platelets; no reticulocytes; and a differential count of 22 neutrophils and 78 small lymphocytes. Reticulocytes remained absent or greatly reduced until later initiation of experimental phenylhydrazine therapy. A splenic biopsy on May 27 showed normal splenic tissue except for foci of degenerating neutrophils and spectacular amounts of iron. The patient was treated with corticotropin from June 1 to June 12. From June 22 to July 2, 1950, a reticulocyte response of 5 and then 15% was obtained during phenylhydrazine administration. There

was a gradual disappearance of reticulocytes after phenylhydrazine therapy was discontinued. The red blood cell count was maintained at 6 to 10 gm. of hemoglobin by means of transfusions. Another bone marrow specimen was obtained four days before the end of phenylhydrazine therapy. This specimen showed 20% fat, an increase in neutrophils, extreme erythroblastic hyperplasia, and iron deposition. The hemoglobin level was 11.3 mg.; reticulocytes, 4.8%; leukocytes, 6,100, with 62 neutrophils, 34 small lymphocytes, 2 monocytes, 2 metamyelocytes and 1 erythroblast. The liver was biopsied on July 18 and showed a spectacular amount of iron storage and slight scarring, but no evidence of leukemia was detectable. The patient was discharged on July 20, 1950, two months before he died and one month before a diagnosis of leukemia was made. The diagnosis at that time was leukemia, primary refractory anemia, and secondary hemochromatosis.

The man was readmitted on Aug. 20, 1950, because of severe sore throat, fever, and weakness. On physical examination, acute tonsillitis and pararectal abscess were found. Hemoglobin level was 5.7 gm. per 100 cc.; red blood cell count, 2,100,000; leukocyte count, 650; platelets, 64,000 per cubic millimeter; and 6 neutrophils, 92 small lymphocytes, and 2 monocytes. There were no reticulocytes. The abscess was drained, and the patient was treated with penicillin and sulfadiazine. A bone marrow biopsy on Aug. 20, five months after onset of symptoms and one month prior to death, showed marked replacement of the marrow by stem cells and very immature granulocytes. The megakaryocytes and the formerly numerous erythroblasts were almost completely gone. A diagnosis of acute myelogenous leukemia was made.

By September, 1950, severe bone pain developed. Physical examination on Sept. 14 revealed only shotty cervical nodes, a spleen palpable at the umbilicus, and pain on palpation over both tibias. Seven days later, severe purpura, jaundice, nausea, and vomiting developed, and the patient died on Sept. 23, 1950. During the month that he lived after the diagnosis had been made, the leukocyte count remained between 800 and 1,200, and the platelets dropped from 88,000 to 21,000 per cubic millimeter. There was complete absence of reticulocytes on three separate occasions. Stem cells composed from 4 to 33% of the leukocytes in the peripheral blood.

The gross findings at autopsy included a yellowish pallor of the skin, generalized hemorrhages, a spleen weighing 825 gm., and a liver weighing 3,100 gm. In the bone marrow, there was extreme hyperplasia of stem cells and immature granulocyte precursors, but megakaryocytes were fairly numerous. The liver, spleen, and abdominal nodes were infiltrated with stem cells, promyelocytes, and myelocytes. The liver, in addition, displayed spectacular hemosiderosis.

CASE 10.—A 58-year-old woman had complained of a mild bleeding tendency for 20 years and of ecchymoses since the fall of 1946. In April, 1947, she had two epistaxes. In June and July, 1947, epitaxis became much worse. Physical examination on Aug. 4, 1947, revealed an obese woman with numerous ecchymoses over her body, bloody discharge from a ruptured tympanic membrane in the right ear, and clotted blood in both nostrils. The hemoglobin level was 11.2 gm. per 100 cc.; red blood cells, 3,400,000; leukocytes, 4,200; platelets, 126,000 per cubic millimeter; and a differential count of 67 neutrophils, 27 small lymphocytes, and 6 monocytes. Bleeding time was 8 minutes 40 seconds. The marrow was solidly cellular because of hyperplasia of all cell lineages, particularly the immature cells. There were no platelets on the marrow smear. The diagnosis of idiopathic thrombocytopenic purpura was considered, although it was felt improbable because of the intense generalized hyperplasia of the marrow, the platelet count at the lower limit of normal, and the late onset of severe hemorrhagic symptoms.

The patient's course continued unchanged, with platelet counts varying from 147,000 to 34,000 per cubic millimeter but with a drop in the leukocyte count to 3,600. In June, 1950, a fever caused by pneumonitis developed, and, beginning on June 14, the woman was treated with sulfadiazine, acetylsalicylic acid (Empirin), and codeine. After this, she became much worse and, on June 17, the hemoglobin level was 8.4 gm.; red blood cell count, 4,200,000; white blood cell count, 1,350; platelets, 34,000, with 81% neutrophils, 15% small lymphocytes, and 4% monocytes. The leukocyte count fell to 150 by June 21, and, on that day, administration of cortisone was begun, 100 mg. every 3 hours and then 100 mg. every 8 hours. Two days later, administration of aureomycin and rutin was begun and resulted in excellent subjective relief. The white blood cell count gradually rose to 4,750 by Aug. 2, 1950, but the number of platelets remained at about 50,000. No abnormal cells were seen in the peripheral blood except for an occasional erythroblast.

During most of 1951, the patient was continually troubled by purpura and mild chronic anemia, and she was again hospitalized on Sept. 19, 1951, because of fever, dyspnea, and weakness. Physical examination revealed a critically ill, feverish woman, with extensive ecchymoses and purpura. The spleen was palpable. There were several light purple, indurated nodules on both arms. The hemoglobin level was 6.5 gm. per 100 cc.; red blood cells, 2,500,000; white blood cells, 1,100; platelets, 9,900 per cubic millimeter; bleeding time, 6 minutes 30 seconds; clotting time (Lee-White), 1 hour and 20 minutes; and reticulocytes, 2.9%. The differential count showed 50 neutrophils, 42 small lymphocytes, and 8 monocytes, with 8 erythroblasts. The Rumpel-Leede phenomenon was present. Cortisone was administered on Sept. 21. Two attempts to obtain sternal marrow specimens were unsuccessful. On Sept. 25, a skin nodule was biopsied. There was a diffuse and nodular inflammatory response, consisting almost entirely of vacuolated mononuclear cells. Several observers agreed the response was not leukemic in nature but probably due to an old lipogranuloma with some recent inflammation. On Oct. 8, an ischiorectal abscess developed; it was drained on Oct. 12. During the remainder of the patient's hospitalization, the white blood cell count, which had dropped to 300 on Sept. 25, gradually rose to 6,100 on Nov. 20, 1951. The differential count remained normal, but erythroblasts were continually found.

Since November, 1951, the patient has been seen approximately monthly in the outpatient department. She had taken 50 to 75 mg. of cortisone daily until the middle of January, 1952, at which time the use of cortisone was stopped until the middle of June, 1952. She has since been treated with cortisone during a period of hospitalization in February, 1953. During this period of hospitalization, she felt badly, and the severe hemorrhagic process continued without any change related to cessation and resumption of cortisone therapy. On May 20, 1952, the spleen was palpated two fingerbreadths below the costal margin. The leukocyte count varied from 2,500 to 6,100 per cubic millimeter; hemoglobin level from 6.5 to 10.8 gm. per 100 cc.; and the differential counts normal except for occasional erythroblasts. Platelets varied from 40,000 to 75,000.

The patient was hospitalized on Feb. 20, 1953, because of extreme fatigue associated with a hemoglobin level of 5 gm. Physical examination showed nothing abnormal except petechiae, purpura, ecchymoses, and a barely palpable spleen. The peripheral blood counts revealed 12,100 platelets; 4.3% reticulocytes; and a differential count of 55 neutrophils, 29 small lymphocytes, 3 monocytes, 1 metamyelocyte, 12 stab cells, and 5 erythroblasts. A final diagnosis had not been established when this paper was written.

CASE 11.—This 61-year-old man was a solderer. He had an attack of gallbladder colic in both 1931 and 1942. He noted indolent, purple, scaling, indurated small masses on both legs on July, 1950. Physical examination on Nov. 8, 1950, showed nothing abnormal except these masses. The leukocyte count was 8,400; hemoglobin level, 12.5 gm.; and red blood cell count, 4 million. The lesions gradually became more indurated and erythematous. Results of physical examination and peripheral blood counts on March 8, 1951, were unchanged except for a drop in the leukocyte count to 5,100. The differential count showed 39 neutrophils, 1 large lymphocyte, 51 small lymphocytes, 6 monocytes, 2 eosinophils, and 1 basophil.

The patient was admitted to the hospital on March 28, 1951, five months before a diagnosis of acute leukemia was made and six months prior to his death. The only pertinent physical finding was the presence of numerous indurated, erythematous, fixed plaques on both legs. Blood chemistry studies on March 12, 1951, revealed 11.5 gm. of hemoglobin; 3,800,000 red blood cells; 4,700 leukocytes; 26,700 platelets; and 44 neutro-

phils, 1 eosinophil, 44 small lymphocytes, and 11 monocytes. The bone marrow was slightly hyperplastic because of an increased number of erythroblasts, but there was a decrease in the number of granulocytes because of maturation arrest at the metamyelocyte stage; only occasional adult granulocytes were seen. Toxic depression of the marrow was suspected. The patient's skin lesions cleared slowly with penicillin therapy. He had one attack of typical gallbladder colic on April 1, 1951.

Early in May, 1951, right upper quadrant pain developed and radiated into the patient's back. Cholecystectomy was performed on May 15, 1951. Sections of a surgical biopsy of the liver showed a nonspecific, poorly defined, granulomatous portal infiltrate. Postoperatively the patient's course was stormy and a pleural effusion developed. The temperature rose to 38 C, and continued malaise and anorexia were present. Acid-fast bacilli were reported on May 21 from specimens of sputum collected in the middle of April. The liver and spleen were palpated by one observer. Treatment with streptomycin was begun. Because of the possibility of a subphrenic abscess, a transthoracic exploration of the right upper quadrant was performed on June 16, 1951. No lesion was found. Marrow from the resected rib showed a definite increase in granulocyte precursors and a decrease in erythroblasts and megakaryocytes but was clearly not leukemic. The blood cell count on June 25 showed 5,050 white blood cells; 9.5 gm. of hemoglobin; and 3,300,000 red blood cells. A differential count was not done. The patient was discharged on June 27, 1951.

Because of continued fever, weakness, and weight loss, the man was readmitted on July 26, 1951, two months before he died. He appeared chronically ill; a lymph node was palpated in the right axilla; the liver was felt 2 cm. below the costal margin; and the spleen was questionably palpable. There was no evidence of unusual bleeding or bruising. The hemoglobin level was 6 gm. per 100 cc.; red blood cell count, 2,100,000; white blood cell count, 12,350; platelets, 146,300 per cubic millimeter; reticulocytes, 7.7%; and a differential count of 17 neutrophils, 15 small lymphocytes, 3 monocytes, 50 myeloblasts, 6 promyelocytes, 7 myelocytes, and 2 metamyelocytes. The bone marrow on July 27, 1951, showed further increase in cellularity due to hyperplasia of extremely immature granulocytes, decrease in erythroblasts and megakaryocytes, and increase in iron. Acute myelogenous leukemia or a leukemoid reaction caused by tuberculosis were strongly suspected two months prior to death. The patient continued a downhill course in spite of treatment with streptomycin.

On Aug. 20, 1951, the hemoglobin level was 9.2 gm. and the red blood cell count 2,700,000 in spite of repeated transfusions. The leukocyte count was 7,100; platelets, 93,500; reticulocytes, 0.9%; and a differential count included 12 neutrophils, 1 eosinophil, 26 small lymphocytes, 8 monocytes, 52 stem cells, and 1 metamyelocyte. The bone marrow on the same day showed diffuse sheets of stem cells, with some promyelocytes. A diagnosis of acute myelogenous leukemia was made one month before death. Purpura and edema developed, and the patient died on Sept. 28, 1951. At death, the number of platelets had dropped to 22,000; hemoglobin remained unchanged because of constant transfusion; and the leukocyte and differential counts were unchanged.

At autopsy, the gross findings were generalized, moderate lymphadenopathy, generalized petechiae and ecchymoses, hepatomegaly, and splenomegaly. Microscopically there were infiltrations of hematopoietic tissues with stem cells and immature granulocyte precursors in the liver, adrenal glands, and testes; active disseminated tuberculosis; and hemosiderosis.

CASE 12.—A 57-year-old woman was first seen in the surgical clinic on March 31, 1950, 11 months prior to death and 10½ months before a diagnosis was made. She complained of generalized aching and pains in her bones of four weeks' duration. At that time, physical examination, hemoglobin level, and red and white blood cell counts were normal. Between March 31 and April 4, 1950, there was marked weight loss, and the patient was admitted to the hospital for study. Except for moderate joint tenderness, physical examination showed nothing abnormal; the hemoglobin level and red and white blood cell and diffential counts were normal. Roentgenograms showed extensive, diffuse demineralization of bone. A diagnosis of postmenopausal osteoporosis was made. The woman was bothered by recurrent attacks of sinusitis until July, 1950, when stomatitis developed. In October, 1950, a bruising tendency developed.

On Nov. 2, 1950, she was again hospitalized because of purpura, painful cervical lymphadenopathy, sinus pain, nasal discharge, and sores in her mouth. The results of physical examination verified these complaints. The hemoglobin level was 8.2 gm. per 100 cc.; red blood cell count, 2,800,000; leukocyte count, 1,850; platelets, 39,600 per cubic millimeter; reticulocytes, 1.6%; and differential count, 7 neutrophils, 86 small lymphocytes, and 7 monocytes. Bleeding and clotting times were normal. A bone marrow specimen was normal except for maturation arrest in the granulocytes and questionable increase in the number of stem cells. A diagnosis of toxic depression of the bone marrow was made, and all medication was stopped except for the administration of penicillin.

The patient's condition remained unchanged, although the leukocyte count gradually rose to 7,000, and 46 erythroblasts appeared in the blood by the end of November, 1950. The painful cervical nodes resolved, and the oral lesions healed. By Dec. 4, 1950, the differential count included two myeloblasts, six myelocytes, two metamyelocytes, and nine erythroblasts, and the leukocyte count was 7,000. During December, there was continued fever, anorexia, and recurrent buccal ulcers, but physical examination was otherwise normal. Repeated differential counts continued to show immature cells in the peripheral blood. Aplastic anemia, either idiopathic or the result of a toxic substance or leukemia was considered to be the most probable diagnosis. By Jan. 20, 1951, there was bleeding from the rectum, and the spleen was palpated for the first time. The leukocyte count had risen to 8,000 per cubic millimeter, with 9 neutrophils, 10 small lymphocytes, 69 medium lymphocytes (lymphoblasts), 1 monocyte, 5 myeloblasts, 5 promyelocytes, 1 myelocyte, and 17 erythroblasts. A bone marrow specimen at that time was solidly cellular primarily because of an increase in the number of stem cells and immature granulocytes, although the number of erythroblasts and megakaryocytes was adequate. A diagnosis of acute myelogenous leukemia was made 11 months after onset of the disease and three weeks before the patient died.

By Feb. 14, 1951, she was much worse. Purpura was grossly manifest, but the liver and spleen were not felt. There was no lymphadenopathy. The leukocyte count was 16,300; platelets, 14,300; reticulocytes, 6.5%; and differential count, 37 neutrophils, 20 small lymphocytes, 1 monocyte, 1 eosinophil, 6 medium lymphocytes, 25 stem cells, 7 myelocytes, 3 metamyelocytes, and 12 erythroblasts. The patient was given 20 mg. of corticotropin intramuscularly for two days and, then, 50 mg. daily until she died on Feb. 19, 1951. The hemorrhagic tendency was not benefited by toluidine blue, and the woman died of a cerebral hemorrhage.

The major abnormality in the gross findings at autopsy was evidence of a widespread hemorrhagic process. The hematopoietic organs were not enlarged. Large areas of stem cells were found in lymph nodes, and most of the bone marrow was replaced by the same cells, while erythroblasts, neutrophils, and megakaryocytes were greatly reduced in number. The sinusoids of the liver and the red pulp of the spleen were filled with stem cells, but the architecture was still preserved.

COMMENT

A major consideration is whether or not the conditions described in these 12 cases, because of the long duration of symptoms, actually should be classified as acute leukemia. The final diagnosis, however, logically rests on the terminal clinical, hematological, and anatomic findings. On this basis, final opinion must be reserved in the patient in case 10 because she is still alive. That case is reported because the course resembles that of the preleukemic phase manifested by the other 11. The patient in case 7 had a very characteristic terminal clinical course that was manifested by an overwhelming increase in the number of immature cells in the peripheral blood,

anemia, thrombopenia, fever, and generalized hemorrhagic process, but, as has already been stated, leukemoid reactions may mimic this pattern. The presence of splenomegaly, however, without myeloid metaplasia, as well as severe thrombopenia make leukemia a probable diagnosis. Unfortunately, no tissue studies were available from the last four months of the patient's life and permission for autopsy was refused; therefore, the diagnosis is not as clearcut in this case (case 7) as in the others. The patients in cases 1, 4, 8, 9, 11, and 12 had terminal clinical, hematological, and autopsy findings characteristic of acute leukemia. Those in cases 2 and 6 had terminal clinical courses and peripheral blood and bone marrow findings of acute leukemia, but other tissues were not available because permission for autopsy examination was refused. The patient in case 3 had a clinical course and peripheral blood values characteristic of acute leukemia, but the bone marrow was not pathognomonic of this disease, and no evidence of leukemia was found in other tissues. The short duration of the leukemic state from a few days to one and one-half months, except in case 4 (4 to 20 months) and case 5 (9 months), indicates an acute or, at most, subacute course.

The possibility still remains that these 12 patients manifest a divergent type or variant of acute leukemia that, in past years prior to the use of transfusions and antibiotics, was fatal because anemia or intercurrent infection developed before the leukemic phase was reached. At a recent meeting at which this paper was presented, we were told of four similar cases by physicians in the audience. In our 12 patients, the cause of death, hemorrhage, is still the major cause of death in acute leukemia.

Ten of the 12 patients (table 1) were women, all of whom were menopausal or postmenopausal, although there was a very wide variation in age and in duration of menopausal state, as well as in whether menopause was spontaneous or induced. The age of the patients is not too unusual, since acute leukemia is, except in childhood, commonest in the older age group. In the few similar cases reported in which the preleukemic state was studied, the majority [10] of patients were not menopausal women. It is probable that the patients in Mallarmé's case [10f] and Scholtz's case 4 [11] were menopausal women. In the mouse, the incidence of leukemia is enhanced by estrogens and decreased by androgens, and spontaneous mouse leukemia is commoner in older than in younger mice.[12]

Six of our patients had allergies of various types, and all six experienced a period of neutropenia, with atrophy and maturation arrest of the bone marrow characteristic of a toxic neutropenia. During the two to three years of this study, at least seven other patients with toxic neutropenia have been seen. They had characteristic atrophy and maturation arrest of granulocytes in the bone marrow, and, during the recovery phase, granulocytic hyperplasia developed, with maturation arrest of the bone marrow severe enough to be classified as leukemoid but without progression into leukemia. Furthermore, two of these seven patients were menopausal women. A similar hyperplastic marrow stage, sometimes coinciding with the presence of immature cells in the peripheral blood, has been described in agranulocytoses, which is also predominantly a disease of middle aged women.[9] Consequently, we did not believe that the diagnosis of acute leukemia was warranted at that stage in the preleukemic phase of the disease.

One of the most striking points was the long duration of the preleukemic as compared to the leukemic phase. The classic histological criteria of acute leukemia, overwhelming of the bone marrow by stem cells, with or without extremely immature granulocyte precursors, and marked decrease in the number of megakaryocytes and erythroblasts, did not develop in some patients until shortly before death. For example, the criteria for the diagnosis of acute leukemia were not fulfilled in cases 1, 2, 3, 6, 7, 8, 9, 11, and 12 until less than two months prior to death and after a preleukemic phase of 3 to 17 months.

An extreme situation was met in case 8 in which peripheral blood studies were not indicative of leukemia and aplastic marrow with a few areas of regeneration were found only 16 days before death. Eight days before death, there were 21 myeloblasts in a leukocyte count of 800 per cubic millimeter. A hiatus leukemicus was noted three days before death. On the day of death, a bone marrow specimen indicative of acute leukemia was found for the first time. Unfortunately, marrow studies were not available during the last 16 days of life, but it would seem extremely unlikely that this patient reached a leukemic state more than 3 to 8 days prior to her death.

The longest duration of the leukemic phase (case 4) was probably 20 months; this patient's disease would, therefore, be in a subacute category. Because of the lack of tissue studies, exact determination of the end of the preleukemic phase could not be made, although it was almost certainly after 10 months.

The onset of acute stem cell or acute myelogenous leukemia is rapid and there is rarely opportunity to study the prodromal phases.[13] In the available literature, we have been able to locate only 12 reports [14] in which a preleukemic phase was studied. The patients reported by Folley [14b] were Japanese persons exposed to an atomic bomb blast approximately two to five years prior to their death. Some of those patients were still living in 1951, but apparently no studies were available during the preleukemic phase. The majority of these persons had an acute leukemic phase of the stem cell or myelogenous variety. The other patients described in the literature had a preleukemic phase varying from two and a half years [10a] to a few weeks,[10g] and all had an extremely acute leukemic phase of the stem cell or myelogenous variety.

The experience almost uniformly reported is that physical evidence in the preleukemic phase in both men and women is characterized by only purpura and necrotic, poorly healing mucous membrane lesions but not by palpable enlargement of the hematopoietic organs.[15] Folley's patients [14b] almost certainly passed through a phase in which the hematopoietic organs were smaller than normal as judged by clinical [16] and experimental animal studies [17] on total body irradiation. In Scholtz's patient,[11a] a woman, the spleen was barely palpable, and there were oral petechiae at the onset of the disease, 18 months before the development of the leukemic phase when hepatomegaly and a sudden spectacular increase in splenomegaly were noted. It is probable

that Beyers' patients, reported to have aplastic marrows, already had leukemia when first seen.[18] These phenomena are in agreement with our experience, since palpable abnormal enlargement of nodes, liver, or spleen was usually delayed until a true leukemic state was reached.

Purpura, usually mild, was the first abnormal physical sign in nine patients. It preceded the date of diagnosis by months or days, except in the two men (cases 9 and 11). In these two men, the spleen was palpable two to four months before the diagnosis was made. In one woman, the spleen was questionably palpable for a short time. Lymphadenopathy was never found until the diagnosis had been verified microscopically. In case 12, no enlarged organs were found even at autopsy. Except in the men, abnormal enlargement of hematopoietic organs was, therefore, a late development restricted to the leukemic phase alone.

Each patient, regardless of the length of the preleukemic phase, had clinical manifestations of a deficiency of at least one facet of marrow hematopoiesis, such as anemia, leukopenia, thrombopenia, or various combinations thereof. The woman in case 5 had an abnormal bruising tendency at least three and possibly eight years prior to the time that diagnosis was made, and a hemorrhagic process was apparent early in two patients (cases 4 and 5). In cases 1, 2, and 9, anemia was the earliest major problem and, in cases 3, 6, and 12, infection, presumably secondary to or aggravated by neutropenia, presented the first major problem. Very early in the preleukemic phase, the patient in case 7 showed evidence of infection, hemorrhagic phenomena, and anemia. It is noteworthy that in almost each patient clinical evidence of bleeding or bruising preceded objective laboratory abnormalities.

In the patients in the preleukemic stage reported on in the literature, there also was evidence of more than one type of marrow insufficiency. In several reports, one aspect was sufficiently prominent so that the cases might be classified as those in which protracted anemia was the major problem [19]; neutropenia, with bouts of infection and degenerating lesions of the mucous membranes, were most prominent [13b]; and those in which the classic concept of aplastic anemia, with anemia, thrombopenia, and neutropenia, was simulated.[20] It is probable that, in the persons exposed to an atomic bomb blast,[14b] there was also a phase in which the symptoms were due to aplastic anemia. It must be emphasized, however, that in both our patients and those reported on in the literature, regardless of the most prominent type of onset, there was some evidence of an abnormal hemorrhagic tendency early in the course of the disease. These, of course, are entirely different from the cases of chronic leukemia described by Minot [21] and Wintrobe,[22] in which, while the disease was asymptomatic, unequivocal chronic leukemia was present. It must be emphasized that, in the preleukemic phase, there was no unequivocal evidence of leukemia in either the peripheral blood or biopsy specimens of the marrow or, in the few instances in which such material was available, in the liver or spleen.

The lack of indications of leukemia in the peripheral blood characterized the preleukemic period in all patients, although other abnormalities were noted. One of the earliest changes in two or three of our patients, as well as in the three described by Mallarmé,[10f] was severe neutropenia, with fairly normal absolute count of small lymphocytes. Even in the rest of our patients, depression of the number of neutrophils in the blood tended to precede and be severer than lymphopenia; this is similar to the experience of Ehrlich and Forer.[10b] Even in cases in which anemia was the early prominent problem,[23] lymphopenia occurred later than did neutropenia.

In our patients, immature leukocytes began to appear in the peripheral blood within a week or two after the diagnosis of acute leukemia was made on other grounds. In case 9, peripheral blood findings were not diagnostic of leukemia until two weeks before the patient died and two weeks after the diagnosis had been made by bone marrow aspiration. Case 4 is the only one that represents the other extreme; immature cells in the peripheral blood were sufficiently numerous 26 months before death to suggest the diagnosis. Similar prolonged preleukemic phases, without immature leukocytes, have been reported; some as long as 3 years [10a] but most on the average of 6 [24] to 18 [25] months from the time the patient was first seen. Naturally, if one were to include the months during which there were noticeable symptoms, the preleukemic phase, without immature white blood cells in the peripheral blood, would be much longer.

Another point that must be emphasized in this connection is that the diagnosis of acute leukemia cannot be based on the presence of immature cells in the peripheral blood. Large numbers of white blood cells, including myeloblasts, may accompany nonleukemic diseases particularly myeloid metaplasia,[2] agranulocytosis,[26] aplastic anemia,[6] carcinomatosis,[27] skin rashes,[8e] and numerous other hematological diseases.[28] Spectacular examples have been described by Herz [8a] (55 stem cells and 24,000 leukocytes) and by Sotilo-Ortiz [8c] in a case of carcinoma of the ovary (12 stem cells, 12 myelocytes, and 7 metamyelocytes and a white blood cell count of 940,000).

A major problem has been the evaluation of the large numbers of monocytes seen frequently in our patients at about the time that immature cells first began to appear; a phenomenon not appreciated by most observers except Collins [10a] and Leya.[10e] As long as even such a capable hematologist as Naegli [13a] comments on the difficulty of distinguishing, in dry smears, between monocytes and myelocytes and metamyelocytes, it will be impossible to determine whether the monocytosis seen is actually because of confusion of this cell type with the myelocyte.

The finding of large numbers of erythroblasts in the peripheral blood in the past has seemed to contradict the diagnosis of leukemia.[8d] It is of interest that each patient except those in cases 9 and 11, the two men, had significant numbers of erythroblasts at varying times. In cases 3 and 4, there were periods in which 50 erythroblasts were counted. In case 9, even though the response to cortisone and corticotropin was reticulocytosis, there were never any erythroblasts noted in the peripheral blood; megaloblasts were never found. In case 1, the only case in which there was extreme erythroblastic hyperplasia of the marrow, and cases 4 and 9, in which there was marked marrow erythroblastic hyperplasia, peripheral blood erythroblastosis was not most marked. In all cases, erythroblastosis was not correlated with erythroblastotic marrow.

Several other authors [29] have described a preleukemic phase characterized by erythroblastic crises, but only Heilmeyer and Schöner have presented clearcut evidence of megaloblastosis in the marrow in the modern sense of a cell lineage characteristic of pernicious anemia.[30] In some instances,[31] erythroblastosis reached a spectacular degree.

Reticulocytes are commonly accepted as indicative of new production of red blood cells in the circulating blood. All of the patients except the one in case 9 had significant periods of reticulocytosis, with counts running usually from 1 to 7%. Even in case 9, the reticulocyte response to phenylhydrazine was 15%. Unfortunately, there is very little material in the literature on reticulocyte response of patients in the preleukemic phase. In Foy's patient, there was a reticulocyte response of 14% after therapy with liver,[10c] but it is possible that this reticulocytosis had nothing to do with treatment and was purely incidental, since there was no response evident in the red blood cell count or hemoglobin. In Heilmeyer's [10d] cases, there was a reticulocyte response of 5 to 11% (case 1) and of 15 to 35% in another (case 2), neither of these was apparently affected by treatment with a variety of hematinics or blood transfusions.

The relationship of the onset of purpura to that of thrombopenia is difficult to interpret because, in the majority of our cases and probably in those reported in the literature, the platelet count was usually not checked until after some evidence of a hemorrhagic tendency was noted. In cases 1, 2, 8, 11, and 12, platelet counts were available at about the time that abnormal bruising was first noted, and, in each case, the platelet count was depressed. In case 2, a normal platelet count was obtained one month prior to the onset of clinically evident purpura. In cases 3, 4, and 5, there was an abnormal bleeding tendency but a normal number of platelets for periods ranging from six months to two years prior to the demonstration of a thrombopenia. In case 9, the platelet count was 62,000 in April, 1950, and there were numerous other low and low normal counts, but unusual bleeding or bruising did not develop until a few weeks prior to the patient's death. In the other cases, adequate information on early platelet counts is lacking. Unfortunately, it is difficult to correlate our results with those in the literature, since, in most cases, platelet counts were not made in the preleukemic state. In the few available, it would appear that abnormal bleeding and thrombopenia developed simultaneously.

Although a detailed consideration of the histogenesis of the disease will be made in a future publication, there are some points of practical diagnostic interest derived from the tissue studies. Examination of the spleen when the diagnosis was made (case 3), three months before diagnosis (case 7), and three and one-half months before diagnosis (case 9) failed to yield any conclusive evidence of leukemia, although there were some minor abnormalities, barely suggestive of leukemia. Similarly, examination of the liver six months before the diagnosis was made (case 1), when the diagnosis was strongly suspected (case 3), and three weeks before the diagnosis was made (case 9) failed to yield any conclusive evidence of acute leukemia. The numerous bone marrow specimens, except in case 4, seemed to follow one general pattern that included the presence of aplasia and maturation arrest in the granulocyte series, sudden or gradual shift to hyperplasia with maturation arrest of the granulocytic lineage, and then, as the change to leukemia ensued, an overwhelming of the marrow by stem cells and immature granulocyte precursors. Up to this final malignant change, the bone marrow specimens presented a sequence of histological patterns seen in acute toxic neutropenias of the type caused by drugs. Erythropoiesis varied in these early biopsies from extreme activity to extreme aplasia.

The differential diagnoses considered during the preleukemic phase (table 2) were primary refractory anemia, with hyperplastic marrow; aplastic anemia; primary or secondary thrombocytopenic purpura; hypersplenism of a pure or mixed type; toxic neutropenia; and miliary tuberculosis, with a leukemoid reaction. The major problem of differential diagnosis was toxic neutropenia that was considered a strong possibility in cases 3, 6, 8, 9, 10, and 12. Even in retrospect, in reviewing the information available and knowing the final diagnosis, it is still impossible to separate these cases from those of toxic neutropenia any earlier than had been done by the

TABLE 2.—*Possible Diagnoses Considered in Preleukemic Phase*

Case	Diagnosis
1	Primary refractory anemia with hyperplastic marrow and acquired hemolytic anemia
2	Toxic aplasia of marrow and acquired hemolytic anemia
3	Hypersplenic neutropenia and toxic neutropenia
4	Primary or secondary thrombocytopenic purpura
5	Nonthrombocytopenic purpura
6	Primary or secondary aplastic anemia
7	Hypersplenism
8	Toxic neutropenia and primary or secondary aplastic anemia
9	Hypersplenism, primary refractory anemia with hyperplastic marrow, and secondary hemochromatosis
10	Primary or secondary thrombocytopenic purpura and toxic neutropenia
11	Toxic neutropenia and tuberculosis with leukemoid reaction
12	Postmenopausal osteoporosis, toxic neutropenia, and aplastic anemia

criteria employed. In cases 1 and 9, the diagnosis was confused with that of primary refractory anemia with hyperplastic marrow of the type described by Bomford and Rhoads [32] because of extreme anemia, erythroblastic bone marrow, and low reticulocyte counts. A diagnosis of hypersplenism was made in case 7 because of reticulocytosis, increased fecal urobilinogen, neutropenia, and thrombopenia. That patient's bone marrow was so cellular at the time that the validity of the diagnosis should have been suspected even though leukemia was not suggested. In cases 4 to 5, the onset was manifested by hemorrhagic diathesis, and splenectomy was considered because of the possibility of idiopathic thrombocytopenic purpura. The patient in case 11 was known to have tuberculosis, and, when splenomegaly and hepatomegaly developed, miliary tuberculosis was thought to be a possibility. It was only later than the bone marrow and peripheral blood gave evidence of leukemia. True aplastic anemia was considered in cases 6, 8, and 12, because of the clinical picture, decrease in all elements in the peripheral blood, and aplastic bone marrow tissue.

A similar variety of clinical findings has been described in the literature. Cases are reported in which the preleukemic state resembled aplastic anemia [24] and others in which there was extreme erythroblastic or megalo-

blastic proliferation or primary refractory anemia with hyperplastic marrows,[10c] pernicious anemia,[33] toxic neutropenia,[34] and thrombocytopenic purpura. The difficulties that may arise in separating these conditions from even the full-blown case of acute leukemia have already been mentioned.

SUMMARY

A preleukemic phase, preceding the development of true acute leukemia, is described as found in studies of 10 and possibly 11 cases of acute leukemia and of one case of subacute leukemia. Ten of the 12 patients were women, and 6 had an allergic diathesis. Physical examination in the preleukemic state, except in the two men, revealed nothing abnormal except fever, evidence of abnormal bleeding, and, occasionally, mucous membrane ulcers. Palpable enlargement of hematopoietic organs usually was first encountered after the leukemic phase had begun. The preleukemic period, which was much longer than the leukemic period in all but one patient, was marked by deficiency of at least one type of marrow function. A hemorrhagic tendency, usually accompanied by thrombopenia, was the commonest early expression of this marrow malfunction. Neutropenia was found comparatively early and preceded the disappearance of small lymphocytes. Monocytosis was fairly common but was hard to evaluate because of the difficulty in differentiating these cells from myelocytes. Erythroblastosis and reticulocytosis, sometimes of spectacular degree, were common.

Immature cells tended to appear in the peripheral blood toward the end of the preleukemic phase, but peripheral blood characteristic of acute leukemia was first seen in the leukemic phase. Biochemical determinations yielded nonspecific results except for the fairly common finding of hyperbilirubinemia and increased fecal urobilinogen indicative of hyperhemolysis.

In the preleukemic phase, the most characteristic early change in the marrow was the development of maturation arrest and aplasia of granulocytes, which was accompanied by an erythroblastic tissue that varied from extreme aplasia to extreme hyperplasia. Thereafter, progressive hyperplasia and maturation arrest of granulocyte precursors developed until the marrow was largely replaced by stem cells and promyelocytes; this marked the beginning of the leukemic phase. Examination of the few available liver and spleen biopsies in the preleukemic phase failed to reveal any marked abnormality. Occasional stem cells were seen in the splenic red pulp immediately prior to the development of the leukemic state.

The major problem in differential diagnosis was the resemblance of the preleukemic state to various blood dyscrasias, especially toxic neutropenia, aplastic anemia, or hypersplenism. This problem in differential diagnosis was not clarified until the leukemic state developed. The leukemic state was almost invariably acute and, in some cases, explosive with regard to its course and resistance to the usual palliative measures.

CONCLUSIONS

On the basis of clinical observations, peripheral blood cell counts, and tissue studies, the preleukemic phase of acute leukemia is described and differentiated from the leukemic phase of acute leukemia.

ADDENDUM

Since this paper was written, we have seen acute myelogenous leukemia develop in five patients, four men and one woman. One patient had secondary polycythemia due to congenital heart disease and was treated with radiophosphorus. Another had polycythemia vera that was treated with radiophosphorus; during the period of treatment, myeloid metaplasia and then terminal acute myelogenous leukemia developed. One patient had lymphosarcoma treated with x-ray therapy; and in the fourth case, the disease was idiopathic. The woman had carcinoma of the breast treated by resection and irradiation, specially of the long bones. The disease pattern of these five patients resembled that described here with regard to the preleukemic and leukemic phases.

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CLINICAL NOTES

ACUTE LEUKEMIA IN TWINS

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The rare observation of more than one person with leukemia in the same family has suggested this report. Acute leukemia affected each of fraternal twins during their second year of life. One twin died at the age of 18 months and the other at the age of 24 months.

REPORT OF CASES

Members of the family included the father, 29 years of age; mother, 32; a son, 9; three daughters, 8, 5, and 4; and the twin boys. The family lived in a small Illinois town. The twin boys, Terry and Jerry, were born Aug. 4, 1943. These twins did not resemble each other closely and were said, by the attending physician, to be fraternal and not identical twins. During pregnancy, the mother was said to have had toxemia with edema, albuminuria, and pyuria.

Jerry weighed 5 lb. 8 oz. (2,494.8 gm.) at birth and gained weight regularly and satisfactorily. He had had no disease and only infrequent, mild respiratory infection. He had received no immunizations. His development was normal. When he was 22 months of age, he was admitted to the hospital on June 5, 1945, with the report that three weeks previously sore throat, fever, and swollen cervical nodes had developed. The fever and sore throat had subsided after therapy with sulfadiazine, but the glandular swelling had persisted. During the week previous to admission, he had been noted to be pale; several "bruised" areas had appeared on his skin; and he had seemed moderately irritable.

On examination, the positive findings were pallor, very slight fever, moderate irritability, several moderate-sized ecchymoses on the legs and back, slightly enlarged, firm spleen, and moderately enlarged liver that extended 5 cm. below the costal margin. All superficial lymph nodes were slightly enlarged and firm; those in the right posterior cervical region were large enough to be visible. Blood examination showed a moderate anemia with a hemoglobin level of 7.8 gm. per 100 cc. and leukocytes 13,800 per cubic millimeter. The clotting time was 4.5 minutes and the bleeding time more than 15 minutes. A blood smear showed marked decrease in platelets, and 95% of the cells were mononuclear leukocytes, most of which were a young blast type. Jerry was given two transfusions of 250 cc. each and discharged on June 8, 1945, with the diagnosis

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of acute leukemia. His mother wrote that for two weeks thereafter he was feverish and irritable but then appeared much better for several weeks. Later the abdomen, possibly the spleen, became swollen and the neck glands larger, and there was considerable hemorrhage from the gums. The hemorrhage continued, although the swelling of the neck and abdomen subsided. Jerry died on Aug. 3, 1945, the day before his second birthday.

Since it was stated by the parents that the other twin, Terry, had died from leukemia a few months previously, the record of his illness was obtained from the physician who had treated him in the Alton Memorial Hospital and who supplied the following data.

Terry weighed 4 lb. (1,814.37 gm.) at birth and did not gain weight quite so well as his twin, but he had no serious illness and developed normally. At the age of 17 months, he was noted to have fever and hemorrhagic areas on the skin. For the next month, his appetite was poor, and he lost weight and refused to walk. On admission to the hospital on Jan. 25, 1945, he had a severe anemia, scattered purpuric spots on the skin, and a moderately enlarged spleen. Laboratory examination showed erythrocytes 1,900,000 per cubic millimeter and hemoglobin (3.5 gm. per 100 cc.). The leukocyte count was 97,000 per cubic millimeter, with 96% lymphocytes and very scanty platelets. A transfusion was given, and, within three days, the leukocyte count fell to 2,000, with no granular form seen and only slight increase in hemoglobin (5.1 gm. per 100 cc.). Terry rapidly became weaker and died on Jan. 29, 1945. Necropsy was not permitted.

COMMENT

Familial leukemia or those instances in which two and occasionally more relatives have suffered from the disease have been noted very infrequently. Most hematologists have shared the view expressed by Naegeli [1] who saw only one case of familial leukemia in 25 years; a woman had myelosis, and her brother had chronic lymphadenosis. Naegeli stated "with the large number of leukemic patients one must expect the probability of such a chance occurrence." Recently, Videbaek [2] has critically reviewed the published familial reports and has found only 26 that he considers authentic examples. He has also made a thorough and laborious investigation of the relatives of 209 patients with leukemia and found that 17, or 8.1%, of such patients had one or more relatives with the disease. Since, in a few reports, the families were related, he was able to add 13 families to the 26 previously reported as having more than one member affected. Most of the affected persons were adults, and all types of the disease were represented, although more than two-thirds of these persons had chronic forms. Half of all patients were over 50 years of age. Videbaek believes it likely that hereditary factors may be of etiological significance in the development of the disease. Such an assumption must also assume that all types of leukemia are very closely related to one another, in spite of the striking clinical and hematological differences.

Acute leukemia, which comprises at least 95% of leukemia in children, occurs with moderate frequency, since between 1940 and 1949 it was reported that an average of 1,100 children under 15 years of age died of leukemia each year in the United States. In the literature, Jelke [3] in 1940 reported the disease in monozygous twins who died at the ages of 4 and 5 months, and Riel [4] in 1948, reported on monozygous twins both of whom died at 3 years of age. The only other record of the disease in siblings is its remarkable and unique occurrence in five of eight siblings in one family reported by Anderson.[5] All of the affected children died between the ages of 5 and 8 years. In this family, there was no other case of leukemia in 135 near or distant relatives. While it is possible that other unreported instances have occurred, familial leukemia is of such interest and rarity that it appears likely that most instances would be reported. At the St. Louis Children's Hospital, over a period of years, no known near relative of 316 children with acute leukemia was known to have suffered from the disease except the twins described. The only other twin in our series was a girl who died from acute monocytic leukemia at 2 years of age. Her identical twin sister is healthy eight years later. Certainly, so far as acute leukemia in children is concerned, the clinical incidence indicates the absence of any hereditary or familial factors in its etiology except in twins.

The only other reported occurrences of leukemia in twins were by Dameshek, Savitz, and Arbor [6] who observed identical twin brothers both of whom died from atypical chronic lymphatic leukemia at 56 years of age and within 10 weeks of each other and by Stobbe and Taeschner [7] who reported identical twins who died from chronic lymphatic leukemia at the ages of 59 and 71 years.

SUMMARY

Fraternal twins who died from acute leukemia at the ages of 18 and 24 months are reported with brief comment on the familial aspects of the disease.

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The Influenza Virus.—The influenza A virus is a parasite whose only natural host is man. To survive, it must pass continually from one human being to another, but from the very effectiveness of its means of transfer—it is inhaled and lodges in the respiratory tract—it soon finds itself in the position epidemiologists call "exhaustion of susceptible hosts." In other words, almost the entire population becomes immune. In such circumstances there are two ways by which a highly transmissible virus can survive. It may, like mumps or measles, live at the expense of the newborn and become a children's disease. Or it may meet the situation, as the influenza virus does, by a transformation of character—a mutation that enables it to overcome its host's immunity. The importance of such mutations is emphasized by their swift race over the world. In 1946 a new type of A virus was isolated in Melbourne. Australia is a long way from the great centers of population in the Northern Hemisphere. But within a year the new virus was causing widespread influenza in those distant places. Influenza vaccines from previous types of virus were powerless against that sudden epidemic of February, 1947. Their failure, incidentally, was largely responsible for our first serious recognition of the importance of the influenza viruses' continual change in type.—F. M. Burnet, M.D., The Iufluenza Virus, *Scientific American*, April, 1953.

MYOCARDIAL INFARCTION IN PREGNANCY

REPORT OF A CASE WITH NORMAL SPONTANEOUS DELIVERY SEVEN MONTHS LATER

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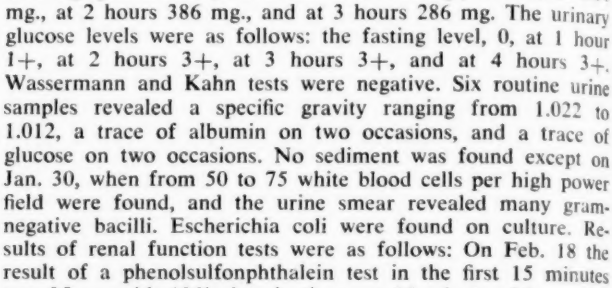
This case is being reported because of the paucity of information on myocardial infarction in pregnancy. No reference to acute myocardial infarction during pregnancy can be found in such standard textbooks as Eastman,[1] Greenhill,[2] Beck,[3] and others.[4] Moreover, only one cardiology reference book was noted to mention the subject. Levine [5] states that he had treated one woman, aged 22, for myocardial infarction and that subsequently she had gone through a pregnancy. A search of current literature revealed no account of the conduct of pregnancy during or immediately following myocardial infarction. Therefore, it seems likely that the analysis of this case may help others in managing similar cases and serve to stimulate additional reports on the same subject.

REPORT OF CASE

A 34-year-old white woman was first seen on Jan. 18, 1952, at 1 a. m. For two days she had noted severe substernal pain radiating to both elbows. That evening the pain had become constant and prostrating in character. She was slightly relieved standing up or sitting up and extremely dyspneic lying down. Moreover, she reported her last menstrual period had begun on Nov. 17, 1951. In three previous pregnancies terminating in normal spontaneous delivery she had given birth to three normal children, aged 14, 12, and 3 years at this time. Her third labor had totaled six hours. During her second pregnancy there was a history of toxemia, with edema of the legs, albuminuria, and elevation of the blood pressure. Since that time she had continued to have moderate hypertension. Nocturia was denied. No family history of hypertension and cardiovascular renal disease was elicited. One great-aunt was diabetic.

When she was first examined at home, physical examination revealed a well-developed, well-nourished woman who appeared acutely ill. Her oral temperature was 99.8 F, pulse 96, respiration rate 20, and blood pressure 158/98 mm. Hg. Her face was flushed. Ophthalmoscopic examination of the fundi revealed no abnormality. Palpation, percussion, and auscultation of the chest also revealed no abnormalities. Examination of the heart revealed the sounds of fair quality with no murmurs and no enlargement. The abdomen appeared normal, with no tenderness nor organ enlargement. No abnormalities of the extremities were noted. She was hospitalized at 6 a. m. Jan. 18, 1952, following the reading of an electrocardiogram indicating an acute anterior wall myocardial infarct.

Laboratory Findings.—On Jan. 19 the red blood cell count was 5,200,000, the hemoglobin level 14.5 gm. per 100 cc., and the white blood cell count 18,000, with 8% band forms, 82% filaments, and 10% lymphocytes. On March 6 the red blood cell count was 4 million, the hemoglobin level 11.3 gm., and the white blood cell count 8,800, with 11% band forms, 71% filaments, 1% eosinophils, 16% lymphocytes, and 1% monocytes. The sedimentation rate on Jan. 19 was 15 mm. per hour; on Jan. 21 15 mm.; on Jan. 22 25 mm.; and on March 6 23 mm. On Jan. 18 the blood glucose level (fasting) was 193 mg. per 100 cc. and the blood urea 8 mg. On Jan. 22 the serum cholesterol level was 186 mg., cholesterol esters 37 mg., and blood lipids 522 mg. On Feb. 22 the alkaline phosphatase level was 3.1 Bodansky units, calcium 10.2 mg., phosphorus 3.1 mg., albumin 4.1 gm., and globulin 2.0 gm. On Jan. 18 the prothrombin time was 13 seconds. On Feb. 2 results of a glucose tolerance test were reported as follows: The fasting level was 104 mg. per 100 cc., at 30 minutes 226 mg., at 1 hour 364 mg., at 2 hours 386 mg., and at 3 hours 286 mg. The urinary glucose levels were as follows: the fasting level, 0, at 1 hour 1+, at 2 hours 3+, at 3 hours 3+, and at 4 hours 3+. Wassermann and Kahn tests were negative. Six routine urine samples revealed a specific gravity ranging from 1.022 to 1.012, a trace of albumin on two occasions, and a trace of glucose on two occasions. No sediment was found except on Jan. 30, when from 50 to 75 white blood cells per high power field were found, and the urine smear revealed many gram-negative bacilli. Escherichia coli were found on culture. Results of renal function tests were as follows: On Feb. 18 the result of a phenolsulfonphthalein test in the first 15 minutes was 95 cc. with 10% dye, in the next 45 minutes 35 cc. with 30% dye, and in the second hour 55 cc. with 10% dye. On Feb. 18 the urea clearance in the first samples was 50 cc. or 93% of the standard clearance with average normal function and in the second sample 56 cc. or 103% of the standard clearance with average normal function. Serial electrocardiograms revealed the classical picture of acute anterior myocardial infarction (figure). On Feb. 16th an x-ray film of the chest revealed the lung fields to be clear, with slight enlargement of the left ventricle; the transverse cardiac diameter measured 12.5 cm. and the transverse thoracic diameter measured 25 cm. A second chest film taken on Sept. 16 showed no change from the previous film.



Comparison of serial electrocardiographic tracings of the patient. The first two electrocardiograms reveal the acute changes of anterior myocardial infarction. The last two electrocardiograms reveal residual changes with marked regression.

Hospital Course.—During hospitalization, treatment consisted of administration of bishydroxycoumarin (Dicumarol) papaverine, sedative agents, including morphine, and an 800 calorie diet. During the first week the patient had a low-grade fever and substernal pain persisted, but after the first week these symptoms disappeared completely. Bishydroxycoumarin therapy was maintained for 28 days, and the prothrombin time was kept between 30 and 35 seconds. The blood pressure was 190/130 mm. Hg on admission and gradually dropped to 106/68 on the 27th day of hospitalization. On Jan. 28 the blood pressure in both arms was 150/110 and in both legs 240/210. Tests for pheochromocytoma were not done. Examination of the urine four times daily revealed an occasional trace of glucose during the day or night. The patient's weight dropped from 140 lb. (63.6 kg.) at the time of admission to 126 lb. (57.3 kg.) at the time of discharge from the hospital. At the time of the initial examination of the chest, a few fine crepitant rales were heard

From the Department of Obstetrics and Gynecology, Buffalo General Hospital and University of Buffalo.

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at the right base; after the first week the chest remained clear. Auscultation of the heart revealed a 2 + soft systolic murmur at the apex and a 1 + faint systolic murmur at the pulmonic area. The patient was kept on bed rest for six weeks, after which she gradually resumed normal activities and was discharged from the hospital on March 13, 1952.

After considerable discussion it was finally decided to allow the patient to carry the pregnancy to term. Although the patient had considerable anorexia, epigastric distress, and very slight edema of the ankles, after hospitalization she had no dyspnea nor orthopnea. On physical examination no abnormality of the lungs was revealed. The heart sounds continued to be of good quality, usually with murmurs. The regimen of restricted activity continued, including 12 hours of bed rest per day plus the usual dietary restrictions.

On Aug. 24 the patient reentered the hospital, complaining of severe epigastric pain and uterine contractions every 12 minutes. At the time of hospitalization she weighed 138 lb. (62.7 kg.), her pulse was 92, and her blood pressure was 180/103. On Aug. 26 with the patient under low saddleblock spinal anesthesia a full-term normal baby boy, weighing 6 lb. 10 oz. (3,005 gm.), was delivered by low forceps.

On Aug. 27 both tubes were ligated with the patient under intravenous thiopental (Pentothal) sodium anesthesia. The postpartum course was uneventful. The fasting blood glucose level was 81 mg. and 98 mg. on two successive days, and the digestion glucose level was 222 mg. Because of the latter finding, it was concluded that this patient had mild diabetes mellitus. The infant's bleeding time was three minutes and the clotting time one minute, but unfortunately his prothrombin time was not obtained. On Sept. 3, one week after delivery, the mother and infant left the hospital in good condition.

COMMENT

This case illustrates the value of a conservative approach to the problem of pregnancy associated with myocardial infarction. Therapeutic abortion was seriously considered because of the acknowledged strain of advancing pregnancy on an already severely damaged heart. It was recognized that the cardiac output is increased 50% in the last trimester of pregnancy,[3] accounting for the consequent danger of congestive heart failure that might be expected to occur in 25% of cases of myocardial infarction some time after the acute episode.[5] During this acute episode, however, it seemed unwise to consider interference because shock, the soft necrotic cardiac tissue, and the possibility of systemic or pulmonary emboli contraindicated anything other than supportive therapy.

During pregnancy, we believe that anticoagulant therapy should be given [6] as in any similar case, for it seems to have no deleterious effect on placental circulation, uterine behavior, nor the condition of fetal blood. In this instance, the bleeding and clotting time of the infant immediately after delivery were normal. We believe that there were distinct advantages in waiting seven months for the occurrence of normal labor rather than adding stress of induced abortion during the second or third month of pregnancy. Certainly, we could assume that the scar in the heart would be firmer at term. We also felt we could anticipate less cardiac strain during a normal delivery in a multipara whose previous labor had been easy than would occur with delivery by cesarean section. This patient had a diabetic blood glucose tolerance curve at the time of the acute infarction and an elevated digestion blood glucose seven months later. Consequently, it was concluded that this patient had diabetes mellitus despite the fact that it is known that many patients with acute myocardial infarction have diabetic glucose tolerance curves.[7]

SUMMARY AND CONCLUSIONS

A 34-year-old white woman with mild diabetes mellitus and moderate essential hypertension sustained an acute anterior wall myocardial infarct when two months' pregnant. She made a good recovery and carried to term without incident and delivered a normal full-term living child. Although no definite conclusions can be based on this experience, it would seem plausible to suggest that coincident pregnancy should not interfere with nor alter the management of myocardial infarction and that all usual measures, including anticoagulant therapy, are indicated. When the patient survives an initial episode in the first trimester, there is ample time for the heart to regain considerable reserve and the pregnancy may be carried to term with a normal delivery—the latter course probably involving less cardiac strain than interruption of the pregnancy earlier in the course of myocardial recovery.

216 Summer St. (Dr. Randall).

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VALUE OF ROUTINE BLOOD SUGAR TESTS IN THE DETECTION OF DIABETES MELLITUS

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For the past 30 years, it has been the practice of our group to perform routine blood sugar tests on all new patients. Because we believe that this is an important method of detecting diabetes, this paper is presented in order to illustrate some of the results we obtained. Our method is advocated for general use in office practice. If all physicians who demand that a complement fixation test for syphilis be performed on all patients would obtain a blood sugar test as well, many cases of early diabetes would be detected.

MATERIALS AND METHODS

This study presents data on the number of new patients in our practice who, solely because the initial blood sugar level was elevated, were later proved to have diabetes. A total of 2,357 consecutive patients entering all services of the diagnostic division of the Cleveland Clinic constitutes the basis of this survey. The majority of these patients were adults; many of them were past middle age. They applied for care during the four week period between Jan. 10 and Feb. 7, 1951. The total includes 57 patients who had either symptoms of diabetes or previously recognized diabetes or who exhibited glycosuria that would have led to a diagnosis of diabetes on the original examination.

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Blood sugar determinations were made by the modified Meyer's picric acid method. A comparison of this method with Benedict's and the Somogyi-Nelson procedures for blood glucose determination showed no significant differences. Hyperglycemia was considered to be present if the blood glucose levels were above a line drawn connecting the successive points on the following time curve: fasting blood glucose, 110 mg. per 100 cc.; one-half hour after a meal, 200 mg.; one hour after, 180 mg.; two hours after, 140 mg.; and three or more hours after a meal, 110 mg. In all patients with hyperglycemia in whom it was practical, a glucose tolerance test was performed. If this was not possible, a blood sugar determination was repeated two and one-half to three hours after a meal, and an attempt was made to have the meal contain 100 gm. of carbohydrate.

RESULTS

There were 113 patients with no history of diabetes in whom tests demonstrated some degree of hyperglycemia without glycosuria on the first urinalysis. The diagnosis of diabetes would, therefore, not have been made in any of these patients if a blood sugar test had not been performed. In only 60 of these patients with hyperglycemia did we conduct further studies to corroborate or refute the tentative diagnosis. There were many reasons for which further investigations were not carried out in the other 53. Many patients lived some distance from the clinic and wished to have recommendations for repeated blood sugar or glucose tolerance tests sent to their attending physicians at home. Some were seriously ill of other diseases that shortened life expectancy and that rendered any evaluation of borderline blood sugar levels of little importance. In some cases, the physician in charge was not convinced of the need for further tests, since hyperglycemia was slight or questionable, such as blood sugar levels obtained while the patient was in a fasting state or three hours after he had eaten that were only slightly above the 110 mg. per 100 cc. range. Attention is directed, however, to the fact that, of 20 patients with blood sugar levels between 110 and 120 mg. per 100 cc. while in a fasting state or three hours after eating, investigation showed 5 to have undiagnosed diabetes. A few patients could not be followed-up other than by repeating the fasting blood sugar test. In some of these patients, we were obliged to use a normal fasting blood sugar level to refute a tentative diagnosis of diabetes that had been made on the basis of hyperglycemia one to three hours after eating. In doing this, some patients almost certainly have been excluded from the diabetic group who would have been included had they undergone a glucose tolerance test.

Summary of Results of Follow-Up Studies of 113 Patients Suspected to Have Diabetes on the Basis of Hyperglycemia Alone

Range of Blood Sugar Level	No. of Patients Suspected to Have Diabetes	No. of Patients in Whom Diagnosis Confirmed *	No. of Patients in Whom Diagnosis Refuted *	No. of Patients Not Followed-Up
111-120	49	5	15	29
121-130	18	3	4	11
131-140	15	7	5	3
141-150	6	1	2	3
151-160	3	1	1	1
161-170	2	1	0	1
171-180	5	1	1	3
181-190	5	1	3	1
190 or above	10	2	7	1
	113	22	38	53

* Diagnoses were confirmed or refuted by results of second blood sugar determination and/or glucose tolerance test.

In the table, the number of patients with hyperglycemia without glycosuria is shown and the distribution indicated. As might be expected the largest number lies in the groups having blood sugar levels closest to normal. Little difference is shown in the frequency of diabetes found at the various original blood sugar levels. This is because the time that elapsed between eating and the time of the test is considered in the interpretation of each value. In most instances, the actual elevation of blood sugar above the normal was slight. As mentioned before, 53 patients were not studied by us after the first tests. Of the 60 investigated, 22 new diabetic patients were found. If the remainder had been similarly studied and had the same incidence occurred, 16 more cases of diabetes would have been recognized.

COMMENT

The insidious onset of diabetes is a considerable hindrance to its recognition, since clinical symptoms are usually absent.[1] As is generally recognized, a single urinalysis in a diabetic patient is often sugar-free, especially in patients in whom the disease is mild.

The importance of detection of diabetes while the condition is mild depends eventually on two chief factors; first, the number of people who have diabetes and, second, whether or not early treatment and control as complete as is now possible can lessen or prevent serious complications, such as renal failure, blindness, or arteriosclerosis. The incidence of diabetes in our population has been variously estimated in the past few years at 1%[2] and 1.7%,[3] and it has been calculated that it will eventually involve 2.1% of men and 3.8% of women.[4]

There are good reasons for believing that complete control leads to fewer complications. The benefit of complete control is recognized by Frederick M. Allen and Elliot Joslin, two great students of diabetes. Important statistical studies also support this view. For example, Wilson [5] and Root [6] showed that patients in whom careful control was maintained for more than 20 years had fewer complications than those who were managed less carefully. White [7] showed that children with severe diabetes

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were more susceptible to early and serious complications than those with a mild form of the disease, and Boyd [8] presents data that indicate that children for whom a rigid discipline was prescribed had fewer complications than those for whom other regimens were prescribed. In Boyd's studies, only 2 of 42 patients who had childhood diabetes for 10 years or longer showed evidence of retinal hemorrhage. In the first of these two, diabetes had been present for 18 of her 20 years of life, and, in the second, there had been several years of noncontrol. Others [9] disagree with this attitude toward control and believe that there is no convincing data to show that the severity of the disease and/or the degree of control parallel the frequency or severity of the complications. We believe that, unless more dependable and more conclusive data to the contrary can be produced, the safest course available includes early detection and early, careful treatment.

SUMMARY

In order to assess the value of routine blood sugar tests, the results in 2,357 consecutive new patients are reviewed. The group includes 57 patients (2.4%) who were known to have diabetes or in whom the disease was diagnosed because of glycosuria. Diabetes was suspected in 113 patients who exhibited hyperglycemia but not glycosuria. Further blood sugar determinations or glucose tolerance tests done on 60 of these persons resulted in the discovery of 22 new diabetic patients (0.93%).

Assuming that a proportionate number of diabetic persons could be found among the patients with hyperglycemia but not glycosuria whom we did not follow up, there would have been 16 additional new diabetic patients or 0.68% of the whole group. If this additional group is added to the two groups previously considered, the incidence of diabetes in the entire group of patients is estimated to be 4%.

It is suggested that routine blood sugar determinations performed at random may increase the number of known diabetic patients from 2.4 to approximately 4%.

2020 E. 93rd St. (6) (Dr. McCullagh).

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Injury to Spine During Lumbar Puncture.—Symptoms of spinal injury, characterized chiefly by severe back pain, muscle spasm over the lumbar area, tenderness over the lumbar spine, and difficulty in bending, stooping, or lifting, may occur immediately or as long as six months after lumbar puncture. In most of the cases [reported] intervertebral disc or vertebral injury occurred following difficult spinal puncture. Radiographic changes are characterized chiefly by thinning of the intervertebral disc and sclerosis, rarefaction, and destruction of the vertebral body. These changes may occur from as early as eighteen days following the puncture to as long as six months after the puncture. The type and extent of the injury caused by the puncture needle is more important in regard to the rapidity of the onset of the symptoms than is the age of the patient or the purpose of the puncture. Treatment of the condition consists essentially in proper immobilization of the spine supplemented by antibiotic therapy if osteomyelitis develops. Emphasis is made of the necessity for sterile technique and careful introduction of the needle in performing lumbar punctures. Utilization of a different level should be practiced if spinal fluid is not obtained easily at the original puncture site.—S. F. Redo, M.D., Spinal Complications Following Lumbar Puncture, *Surgery*, May, 1953.

SURVIVAL FOR TWENTY-NINE YEARS IN CHRONIC LYMPHOCYTIC LEUKEMIA

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The diagnosis of leukemia is considered a death sentence, and, in older age groups, it produces an unwarranted degree of fear on the part of patients with chronic leukemia as well as in their relatives. The average length of life in 129 patients with chronic lymphocytic and 236 patients with chronic myelocytic leukemia collected from various sources was reported as 3.52 and 3.34 years, respectively, by Wintrobe and Hasenbush.[1] Moffitt and Lawrence [2] selected 16 patients with chronic lymphocytic leukemia and 15 patients with chronic myelocytic leukemia of long duration and calculated the average rates

TABLE 1.—*First Available Laboratory Report of Patient in Case Report*

	Findings *	Normal
Color index	0.75	1.0
Erythrocytes	5,000,000	4,500,000 to 5,000,000
Leukocytes	48,800	6,000 to 10,000
Hemoglobin	75%	100%
Polymorphonuclear neutrophils	12.5%	70%
Eosinophils	1%	1-2 to 4%
Mast cells	0.5%	1-40 to 1-2%
Small lymphocytes	84.5%	20 to 25%
Large lymphocytes Large mononuclear cells	1.5%	5 to 10%
Transitional cells	0	Less than 1%
Neutrophilic myelocytes	0	0
Eosinophilic myelocytes	0	0
Basophilic myelocytes	0	0
Normoblasts	0	0
Megaloblasts	0	0
Microblasts	0	0
Macrocytes	0	0
Microcytes	0	0
Poikilocytes	0	0
Polychromasia	0	0
Plasmodium malariae	Negative	0
No. leukocytes counted	200	..
Widal reaction	..	Negative
Parasites or bacteria	..	0
Coagulation (Brodie Appa.)	..	3 to 8 min.
Agglutination and hemolysis	..	..
Wassermann reaction	..	Negative
Gonorrhea complement fixation	..	Negative

* A number of fragmentary nuclear structures poor in chromatin were present. Thirty of these "fragile cells" were observed in counting of the 200 leukocytes.

of survival after diagnosis as 8.16 and 6.33 years. Many individual patients, however, exceed this average survival rate by many years. These patients can often be kept in happy, productive states for long periods of time by careful management. McGavran's [3] report of lymphocytic leukemia of 25 years' duration is of unusual interest.

We report a case in which the well-documented diagnosis of lymphocytic leukemia was made in 1923. The patient died 29 years later, in 1952. We have been unable

From the Scripps Metabolic Clinic.

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2. Moffitt, H. C., Jr., and Lawrence, J. H.: Chronic Leukemia of Long Duration, with a Report of 31 Cases with a Duration of Over Five Years, Ann. Int. Med. **30**: 778-790 (April) 1949.

3. McGavran, C. W.: Lymphatic Leukemia of Twenty-Five Years' Duration, Ann. Int. Med. **12**: 396-402 (Sept.) 1938.

to find a report of a patient with leukemia who survived as long as 29 years.

REPORT OF A CASE

A white, married, retired businessman, aged 73, was referred to us for treatment with radioactive phosphorus on June 12, 1951. His chief complaint was fatigue, which he had noted for approximately one year.

The present illness began in April, 1923, at which time the patient was admitted to the Broad Street Hospital in New York City for treatment of an infected mosquito bite on the left side of his head. The leukocyte count at that time was said to be 65,000 per cubic millimeter, and a diagnosis of lymphocytic leukemia was made. X-ray therapy was started, and potassium arsenite (Fowler's) solution was given by mouth. The patient retained many of the copies of his blood counts, and the earliest available count was made on Dec. 28, 1923 (table 1).

Several courses of x-ray treatment were given between 1923 and 1928. The patient retired from business in 1925 because of the diagnosis and established residence in the Los Angeles area of California. No x-ray treatment was given from 1928 to 1931, and then an unknown number of x-ray treatments were given until 1945. No further specific treatment had been given after 1945. The patient stated that he had felt fairly well but that he tired rather easily until about one year before he was referred to us when he noticed increasing fatigue.

The patient had had pneumonia and pleurisy two or three times at the age of 6 or 7. Peritonsillar abscess occurred several times in early adult life until the tonsils were removed in 1913. An operation for "a ruptured appendix" was performed in 1935. The family history disclosed no instance of leukemia or other blood dyscrasia.

Physical examination revealed a well-developed man of average spare nutrition who did not appear ill. He was 69.5 in. (176.5 cm.) tall and weighed 140 lb. (63.5 kg.). Temperature, pulse, and respirations were normal. The blood pressure was 180/100 mm. Hg. The skin and mucous membranes were normal. Mild hypertrophic changes of the finger joints were the only abnormalities of the skeleton and extremities. There

TABLE 2.—*Summary of Blood Studies and Treatment in Patient with Leukemia, 1923 to 1952*

Date	Hemoglobin, %	Red Blood Cells *	White Blood Cells *	Platelets	Lymphocytes, %	Treatment	Remarks
12/28/23	75	5,000,000	48,800	.....	86	X-ray and potassium arsenite solution	Patient treated at Broad Street Hospital, New York
3/ 8/24	78	4,900,000	53,390	.....	84.8	X-ray and potassium arsenite solution	.....
3/31/25	89	5,190,000	65,133	.....	81.5	X-ray and potassium arsenite solution	.....
3/ 3/26	89	4,890,000	76,600	.....	89	X-ray and potassium arsenite solution †	.....
3/11/29	85	5,100,000	108,200	.....	86	.....	.....
5/25/31	..	.....	118,000	.....	..	X-ray	.....
4/25/44	76	4,240,000	183,300	.....	91	X-ray	.....
10/ 2/45	79	4,600,000	80,800	.....	93.5	X-ray	.....
1/ /46	..	.....	96,000	.....	..	.....	.....
2/ /47	..	.....	150,000	.....	..	.....	.....
3/ /48	..	.....	224,000	.....	..	.....	.....
9/ /49	..	.....	235,000	.....	..	.....	.....
6/12/51	65	3,440,000	240,000	.....	96	.....	Patient treated at Scripps Metabolic Clinic
8/ 9/51	67	4,080,000	420,000	110,000	97	P_{32}, 3 mc. orally	.....
8/24/51	65	3,600,000	275,000	122,000	97	P_{32}, 3 mc. orally	.....
10/ 2/51	61	3,000,000	275,000	105,000	99	P_{32}, 3 mc. orally	.....
10/16/51	62	3,900,000	290,000	70,000	99.5	P_{32}, 3 mc. orally	.....
12/ 4/51	73	3,760,000	243,000	55,000	..	P_{32}, 4 mc. orally	.....
12/21/51	45	2,200,000	175,000	54,000	..	Transfusion, 500 cc.	Mild generalized purpura
12/22/51	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
12/24/51	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
12/26/51	75	3,600,000	149,000	45,000	98	.....	.....
1/ 2/52	73	4,000,000	94,000	54,000	96	.....	Mild skin eruption over arms, thorax and thighs
1/18/52	71	3,530,000	166,000	70,000	100	.....	.....
1/30/52	68	3,390,000	153,400	.....	..	Cortisone, 300 mg. in 24 hr.	Severe generalized exfoliative dermatitis
1/31/52	..	.....	.....	.....	..	Cortisone, 200 mg. in 24 hr.	.....
2/ 1/52	..	.....	.....	.....	..	Cortisone, 100 mg. in 24 hr.	.....
2/11/52	59	2,250,000	201,800	.....	100	.....	Dermatitis improved
2/15/52	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
2/21/52	..	.....	.....	.....	..	Nitrogen mustard, 6.1 mg. intravenously	Dermatitis worse
2/22/52	..	.....	.....	.....	..	Nitrogen mustard, 6.1 mg. intravenously	.....
2/26/52	..	.....	.....	.....	..	Nitrogen mustard, 6.1 mg. intravenously	.....
2/27/52	..	.....	157,000	80,000	100	Nitrogen mustard, 6.1 mg. intravenously	Dermatitis unimproved
3/ 6/52	68	2,260,000	131,000	.....	100	Urethane, 1 gm. orally three times a day	Dermatitis unimproved
3/ 7/52	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
3/ 8/52	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
3/10/52	71	3,470,000	112,600	.....	98.5	.....	.....
3/28/52	62	3,000,000	62,000	.....	100	Cortisone therapy discontinued Corticotropin (ACTH), 100 mg. in 24 hr. intramuscularly	.....
4/ 2/52	51	2,500,000	39,000	90,000	96	Corticotropin (ACTH), 75 mg. per day intramuscularly	Dermatitis markedly improved
4/ 4/52	..	.....	.....	.....	..	Transfusion, 500 cc.	.....
4/ 5/52	..	.....	.....	.....	..	Corticotropin (ACTH), 50 mg. in 24 hr. intramuscularly	.....
4/ 7/52	67	2,670,000	45,200	.....	100	Corticotropin (ACTH) therapy discontinued	.....
4/10/52	57	2,770,000	38,400	.....	100	Corticotropin (Acthar gel), 80 mg. per day Urethane therapy discontinued	Dermatitis worse
4/17/52	47	2,700,000	27,700	.....	99	Corticotropin (Acthar gel) therapy discontinued	Dermatitis worse
4/18/52	..	.....	.....	.....	..	.....	Patient died suddenly

* Per cubic millimeter.
† X-ray therapy and administration of potassium arsenite (Fowler's) solution continued through 1928.

was no enlargement of the peripheral lymph nodes. The retinal arteries showed moderate narrowing and tortuosity and increased light reflexes, but further examination of the head and neck revealed no important abnormalities. On examination, the lungs were normal. The heart was not enlarged and the sounds were clear and regular. A soft systolic murmur was present over the precordium, with a maximum at the apex that was not transmitted. The tip of the spleen was palpable at the left costal margin, but no other abdominal masses were present. The external genitalia were normal. The prostate was slightly enlarged but of normal consistency. Deep tendon reflexes were normal, and no abnormal reflexes were present.

Laboratory examination revealed a hemoglobin level of 9.8 gm. per 100 cc. (65%); red blood cell count 3,440,000 per cubic millimeter; and white blood cell count 240,000 per cubic millimeter, with a differential count of 200 cells that yielded 96% lymphocytes and 4% neutrophils. The lymphocytes were predominantly mature; a moderate number of smudges were present; there was slight anisocytosis of erythrocytes; and the platelets were decreased to 110,000 per cubic millimeter. The bone marrow was hyperplastic; the megakaryocytes were normal in appearance and distribution; and the lymphocytes were mature. The differential count revealed 95.1% lymphocytes, 0.6% myeloblasts, 2% neutrophils, and 2.3% normoblasts. The blood type was group O, Rh positive. The bleeding time was 3 minutes, and the clotting time was 16 minutes by the Lee and White's method (normal for this laboratory, up to 20 minutes). Clot retraction was complete in 24 hours. Reaction to the Kahn test was negative. On urinalysis, the fluid was clear and straw colored. The specific gravity was 1.016, and there was no albumin or sugar. The sediment contained occasional red and white blood cells and hyaline casts. The blood sugar was 98 mg. per 100 cc. and the urea 56 mg. per 100 cc. The stool contained no blood, ova, or parasites. A roentgenogram of the chest showed that the right costophrenic angle was obliterated by adhesions. There was no evidence of enlarged mediastinal lymph nodes. Another roentgenogram showed that the lower edge of spleen was just below costal margin. An electrocardiogram showed nothing abnormal.

There was some question as to the desirability of further specific treatment of the leukemia, but it was undertaken because of the patient's complaint of increasing fatigue. As he did not desire another course of irradiation, 16 mc. of radioactive phosphorus were given in small, divided doses by mouth between Aug. 9, 1951, and Dec. 4, 1951. There was no important change in the patient's condition, and transfusions were given in December, 1951, because of increasing anemia. A generalized exfoliative dermatitis occurred in January, 1952, and the patient's condition deteriorated steadily with an increase in nitrogen retention until sudden death occurred on April 19, 1952. The blood urea had risen to 120 mg. per 100 cc. on April 18, 1952, the day before death, although urinary output had averaged 1,000 cc. every 24 hours. Phenobarbital could not be ruled out as a cause of the exfoliative dermatitis, although skin biopsy revealed specific infiltration with lymphocytes. In two other patients with chronic lymphocytic leukemia, we have had similar experiences with exfoliative dermatitis that followed irradiation and that presented no indications of drug sensitization. It was felt that little was accomplished by our attempts at treatment (table 2).

Autopsy was performed on April 21, 1952, and indicated (1) chronic lymphocytic leukemia, (2) arteriosclerosis, (3) coronary arteriosclerosis, grade 2 and 3, (4) nephrosclerosis, grade 3 to 4, (5) occlusion of the left circumflex coronary artery, and (6) small, left posterior, myocardial infarction.

SUMMARY AND CONCLUSIONS

Survival for 29 years is reported following well-documented diagnosis in a case of chronic lymphocytic leukemia. It is felt that an optimistic viewpoint is desirable in chronic leukemia, as the life expectancy of certain patients far exceeds that reported to be the average in large series of patients.

476 Prospect St. (Dr. Marlow).

CHEMICAL LABORATORY

This is the second of several reports on cigarettes, cigarette smoke, and filters by the Chemical Laboratory of the American Medical Association. The first report appeared in THE JOURNAL, *July 4, 1953, page 917.*

WALTER WOLMAN, PH.D., *Director.*

A STUDY OF CIGARETTES, CIGARETTE SMOKE, AND FILTERS

2. Special Low-Nicotine Cigarettes

There is considerable difference in the nicotine content of the various types of tobacco used in cigarettes. Bailey and Petre [1] and Bogen [2] reported the following approximate values for nicotine content of several types of cigarettes:

Type of Cigarette	Approximate Content, % Nicotine
Blended	1.9-2.7
Virginia (flue-cured)	2.5-3.4
Levantine	1.0-1.5
Denicotinized	0.8-1.4
Puerto Rican	0.8-1.2

A typical modern blended cigarette contains approximately the following proportions of tobacco [1]:

Flue-cured	60%
Burley	15%
Maryland	10%
Levantine types	15%

Some of the more inexpensive brands omit the Levantine types.

The nicotine content of flue-cured tobaccos was found to range from an average of 2.36% for the low-nicotine South Carolina tobacco (U. S. type 13) to 3.36% for the higher nicotine Danville tobacco (U. S. type 11)[3] for the five years 1928 through 1932. Burley tobaccos, on the other hand, contain more nicotine than flue-cured tobaccos. A nicotine content of about 3.5% is probably representative for this type. Maryland tobacco and Levantine types have a relatively low nicotine content. Bailey and Petre [1] found 2.12 and 2.26% nicotine in the leaf web of a sample of Maryland tobacco from the 1930 season.

These nicotine values are subject to considerable variation, depending on the position of the leaf on the plant, weather conditions during the growing season, type of tobacco, region of growth, and cultural practices. The values reported by Bailey and Petre [1] for the Maryland tobacco grown in 1930 were high because hot, dry weather had prevailed during the growing season. A sample of the same grade and type from the 1932 crop gave values of 0.86 and 0.83% nicotine.

Many investigators have reported that the nicotine content of the leaf increases from the bottom to the top of the plant. Darkis and his collaborators [4] reported that the nicotine in flue-cured tobacco from a good growing season ranged from 1.94% in the lower leaves (secured by the first priming—a method of harvest in which leaves are pulled from the plant as they mature) to 3.76% in the upper leaves (the sixth priming), with a composite sample containing 3.04% nicotine. This

1. Bailey, C. F., and Petre, A. W.: The Modern Cigaret Industry, J. Indust. Engin. Chem. **29**: 11-19, 1937.

2. Bogen, E.: The Composition of Cigarets and Cigaret Smoke, J. A. M. A. **93**: 1110-1114 (Oct. 12) 1929.

3. Darkis, F. R.; Dixon, L. F., and Gross, P. M.: Flue-Cured Tobaccos Factors Determining Type and Seasonal Differences, J. Indust. Engin. Chem. **27**: 1152-1157, 1935.

4. Darkis, F. R.; Dixon, L. F.; Wolf, F. A., and Gross, P. M.: Flue-Cured Tobacco: Correlation between Chemical Composition and Stalk Position of Tobaccos Produced under Varying Weather Conditions, J. Indust. Engin. Chem. **28**: 1214-1223, 1936.

entire range will not appear in tobacco destined for cigarettes, however, since generally the leaves from near the middle of the plant are employed for this purpose. Most of the remainder goes into other smoking mixtures and chewing tobacco.

Tobaccos for the so-called denicotinized cigarettes are prepared from regular tobaccos. According to Bailey,[5] they are usually prepared by a resweating process. This is accomplished by treatment of the tobacco with superheated steam or by heating in vacuum chambers. Numerous other processes are based on the extraction of the nicotine by organic solvents or on the treatment of the tobacco with the vapors of an aqueous ammonia solution. These vapors decompose the naturally occurring salts of nicotine (oxalate, acetate, citrate, and malate), and the free nicotine is entrained in the vapors.

Certainly the term "denicotinized" is a misnomer, as it would connote "nicotine-free" to the uninitiated, and the presently available brands contain about one-half the nicotine found in "regular" cigarettes. Pyriki[6] has proposed the terms "nicotine-poor" for tobacco containing 0.5 to 0.6% nicotine and "nicotine-free" for tobacco containing 0.1 to 0.15% nicotine. None of the tobaccos examined are nicotine-free in this sense.

The tobacco used in the cigarette designated as brand G in this report was developed by the Kentucky Agricultural Experiment Station[7] from three strains of low-nicotine Cuba cigar tobacco obtained in 1933 from the Kaiser Wilhelm Institute. This tobacco was crossed with burley in order that the new variety "should carry the recessive color factors of burley because burley is a light-colored tobacco when cured and light color is commonly associated in the mind of the public with mildness."[7] The varieties resulting from the crosses and back crosses of the low-nicotine cigar tobacco with burley are like burley but have a low nicotine content. They have been designated a subtype of burley and have been established as class 3, type 31-V, air-cured tobacco by the United States Department of Agriculture.

This report gives the results of smoking experiments on two brands of so-called denicotinized cigarettes, brands E and F, and one brand of cigarette containing the tobacco especially bred for its low nicotine content, brand G. Brand D, the "regular" cigarette from the first report,[8] is again included for comparison.

The methods of analysis used and the conditions employed have been described in the first report.[8] Briefly, 47 mm. of each cigarette was smoked (two-thirds of a "standard" 70 mm. cigarette) using 35 ml. puffs of two seconds' duration taken once a minute.

Brand G is the only cigarette examined thus far that has contained significant quantities of nornicotine. Nornicotine differs chemically from nicotine in that the nitrogen atom of the pyrrolidin ring is not methylated. The figures in column 6 of the table were obtained by the method of the Association of Official Agricultural Chemists[9] with the exception of the figure for brand G. These figures for brand G were obtained by the method of Bowen and Barthel,[10] which quantitatively measures the amounts of both nornicotine (0.45%) and nicotine (0.31%). The value found by the Association of Official Agricultural Chemists method for the total steam volatile alkaloids including nornicotine was 0.79%.

As in the first report, the figures in column 8 of the average volume of mainstream smoke (smoke emerging from the puffed end of the cigarette) per cigarette were obtained by multiplying the average number of puffs required to smoke 47 mm. of a cigarette by the volume of each puff (35 ml.). The figures in column 10 showing the proportion of nicotine transferred from the smoked portion of the cigarette to the mainstream smoke are again relatively constant as in the first report, with the exception of brand G.

The weight of nicotine found in the mainstream smoke as shown in column 9 shows that the smoke of the "denicotinized" brands E and F contains about one-half the nicotine found in the smoke of a "regular" cigarette, brand D. The amount of tars in the smoke of these cigarettes does not differ materially from the tars found in the smoke of brand D as shown in column 11. The smoke of brand G contains significantly less nicotine than that of other brands but it contains a greater amount of tars.

Physical Characteristics and Analysis of Four Brands of Cigarettes

	1	2	3	4	5	6	7	8	9	10	11
	Date Sample Obtained	Average Weight of Cigarette, Gm.	Length of Cigarette, Mm.	Average Circumference of Cigarette, Mm.	Moisture in Tobacco, %	Nicotine in Tobacco (Moisture-Free Basis), %	Weight of Tobacco Actually Smoked (Dry Weight), Gm.	Average Volume of Mainstream Smoke per Cigarette, Ml.	Weight of Nicotine Found in Mainstream Smoke per Cigarette, Mg.	Nicotine in Tobacco Actually Smoked which is Transferred to Mainstream Smoke, %	Weight of Tars Found in Mainstream Smoke per Cigarette, Mg.
Brand E	October, 1952	1.069	69.5	26.4	10.01	0.99	0.625	344	1.37	22	15.4
Brand F	April, 1953	1.039	70.0	26.0	9.66	0.93	0.607	322	1.42	25	16.4
Brand G	April, 1953	1.028	69.7	26.3	8.99	0.31 0.45*	0.604	331	0.67 0.15*	36 6*	23.2
Brand D	February, 1953	1.094	70.0	26.5	10.71	2.02	0.635	356	2.74	21	17.8

* Nornicotine.

5. Bailey, E. M.; Nolan, O. L., and Mathis, W. T.: "Denicotinized" Tobacco, Conn. Agr. Expt. Sta. Bull. **295**: 338-351, 1928.

6. Pyriki, C.: Über das Auftreten von Nicotin in Zigarettenrauch, Ztschr. f. Untersuch. d. Lebensmitt. **62**: 95-98, 1931.

7. Valleau, W. D.: Breeding Low-Nicotine Tobacco, J. Agric. Res. **78**: 171-181, 1949.

8. A Study of Cigarettes, Cigarette Smoke, and Filters: 1. Filter-Tip Cigarettes, report of the Chemical Laboratory, J. A. M. A. **152**: 917-920 (July 4) 1953.

9. Association of Official Agricultural Chemists, Official Methods of Analysis, ed. 7, Menasha, Wis., The Collegiate Press, George Banta Publishing Company, 1950, p. 69.

10. Bowen, C. V., and Barthel, W. F.: Determination of Nicotine and Nornicotine in Tobacco, J. Indust. Engin. Chem., Anal. Ed. **15**: 740-741, 1943.

The Cervix.—The abnormal cervix should be treated. All anatomic defects should be repaired, cauterized or coned away. There should be no erosion and no visible infection present. The anatomic and histologic external os should correspond. The bacterial flora of the vagina should also be examined. The acidity of the vagina should be aided by lactic acid douches, and not by acetic acid in the form of bacterial laden vinegar that is so often prescribed, and the normal Döderlein bacillus should be restored and maintained if possible. Every woman should have her cervix examined at least once a year; between the ages of 38 and 55, twice a year is looked upon with approval by all well trained and experienced gynecologists. Every cervix must be examined with suspicion, and those patients with any irregular bleeding, hypermenorrhea, postcoital or postmenopausal bleeding should be repeatedly examined and treated by intelligent radicalism.—C. E. Galloway, M.D., The Abnormal Cervix, *The Surgical Clinics of North America*, February, 1953.

COUNCIL ON PHARMACY AND CHEMISTRY

REPORT TO THE COUNCIL

The Council has authorized publication of the following reports. R. T. STORMONT, M.D., *Secretary.*

AN IMPROVED TEST OF SPERMICIDAL ACTIVITY WITHOUT DILUTION OR MIXING

Clarence J. Gamble, M.D.
Milton, Mass.

Comparisons of the clinical effectiveness of contraceptive materials are difficult and subject to large errors because of the unavoidable variations in the correctness and regularity of their use. Attempts to limit observations to those who are regular users are disappointing; many who claim regularity as long as the method is successful may report irregularity of some duration after a pregnancy leads to detailed interrogation. These uncertainties in clinical testing have led to a search for laboratory procedures that may give an indication of clinical efficiency.

SPERMICIDAL TESTS INVOLVING MIXING AND DILUTION

Baker made a careful study of spermicidal powers by mixing equal quantities (0.3 cc.) of semen with physiological salt solutions (0.9% sodium chloride) in which various concentrations of pure substances were dissolved. He determined the lowest concentration of the substance in the final mixture that would immobilize the sperms in human semen in 30 minutes.[1] In testing jellies and suppositories, he and his collaborators mixed 2 gm. of one suppository with 6 cc. of saline and found the greatest dilution of the filtrate that would stop the motion in 30 minutes.[2] He applied these tests to many pure substances and commercial contraceptives.

Voge recommended the study of motion of the sperms after shorter exposures. He measured immobilization times after mixing jellies with equal or double volumes of semen.[3]

To permit the study of many mixtures with the same ejaculate, Brown and Gamble [4] used about 0.04 cc. of semen. They based their comparisons on the period of time required for complete immobilization after thorough mixing. When equal quantities of semen and contraceptive material were mixed (approximating the ratio found in clinical use), the duration of motility was so brief that distinctions could not be made between the more and the less active mixtures. Therefore, the contraceptive jelly was diluted with 0.9% sodium chloride solution. Final proportions of jelly, 0.9% sodium chloride, and semen of 1:4:5, respectively, gave conveniently distinguishable immobilization times. The recorded time was that of the immobilization of the last discoverable sperm. This method is used as one of the criteria for acceptance of contraceptive materials by the Council on Pharmacy and Chemistry of the American Medical Association.[5]

The "saturation test" of Millman [6] measures the quantity of human semen required in successive additions to 0.05 cc. of jelly to immobilize the sperms within one minute after thorough mixing. For some mixtures, as much as 18 times the volume of the jelly is required. Under the usual clinical conditions this proportion would correspond to an ejaculate of about 90 cc. This is so far beyond the usual quantity that it seems doubtful that differences at such dilutions have clinical significance.

SPERMIDICAL TESTS WITH UNDILUTED CONTRACEPTIVE MATERIALS

Baker, Ranson, and Tynen [2] recognized that the ability to release immobilizing material without stirring and dilution was an important characteristic of a contraceptive mixture. In an experiment termed a diffusion test, the jelly or suppository was smeared over the bottom of a glass capsule and overlaid with 1.25 cc. of human semen. At varying times portions of the latter were removed and examined for motility.

This modification seems a closer approach to postcoital conditions than mixing and dilution. However, the repeated sampling introduces a stirring not present in the vagina, and the procedure gives no indication whether the sample of semen examined comes from the portions in immediate contact with the spermicide or from the higher portions of the fluid.

AN IMPROVED DIFFUSION METHOD

To approximate vaginal conditions, a procedure has been developed in which sperms are observed in semen that is in direct contact with the spermicidal material. For convenience in presentation this will be described in the form considered most desirable. The experiments and reasoning that led to the steps and arbitrary dimensions recommended will be given subsequently.[6a]

Semen, which is secured from young donors by ejaculation into a vial, is stored in an ice bath. It is customarily used for the test one to three hours after production.

Glass tubes of 2 mm. internal diameter and approximately 2 cm. long are prepared. Semen, held in a pipette of the eye dropper variety, is run into the end slightly more than 5 mm.

To secure a part of the contraceptive mixture that has not been affected by evaporation, the first portion (about 2 cc.) of the contents of the flexible metal tube in which it is usually supplied is discarded. The jelly-filled [7] mouth of the tube is placed against the end of the semen column. The latter has been slanted downward at about 45°, making it bulge slightly from the end of the tube to avoid trapping an air bubble between it and the jelly. The jelly is forced into the glass tube for a distance of 10 mm. or more, displacing the semen, which is not allowed to reach the other end of the tube.

To prevent evaporation, paraffin (which melts at about 56 C) is heated to just above the melting point and is swabbed onto each end of the tube. Possible contamination of the semen with jelly from tubes that have been sealed previously is avoided by using one dish of paraffin for the semen ends of the tubes and another for those containing the jelly.

This tube, with another of the same diameter, is placed on a microscope slide and covered with a coverglass; the adjacent surfaces of the latter two have been smeared with microscope immersion oil. The length of the semen column is now measured, using the mechanical stage of the microscope, from the tip of the cone [8] formed by the jelly to the nearest part of the meniscus where air and semen meet. If this is longer than 5.3 mm. or shorter than 4.7 mm., the specimen is discarded.

The tube, in a horizontal position, is obliquely illuminated by a 60 candlepower automobile headlight bulb with a small filament; this light is placed close beyond the tube, and about

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From the Department of Anatomy of Harvard Medical School.

1. Baker, J. R.: The Chemical Control of Conception, London, Chapman & Hall, Ltd., 1935, p. 44.

2. Baker, J. R.; Ranson, R. M., and Tynen, J.: The Spermicidal Powers of Chemical Contraceptives: Approved Tests, J. Hyg. **37**: 474 (July) 1937.

3. Voge, C. I. B.: The Chemistry and Physics of Contraceptives, London, Butterworth and Co., Ltd., 1933, pp. 80, 100, and 185.

4. Brown, R. L., and Gamble, C. J.: A Method of Testing the Relative Spermicidal Effectiveness of Contraceptives, and Its Application to 10 Commercial Products, Human Fertil. **5**: 97 (Aug.) 1940. Gamble, C. J., and Hamblin, L.: The Spermicidal Times of Contraceptive Jellies and Creams, 1949, report of the Council on Pharmacy and Chemistry, J. A. M. A. **148**: 50 (Jan. 5) 1952.

5. New and Nonofficial Remedies, Philadelphia, J. B. Lippincott Company, 1952, p. xxxii.

6. Millman, N.: A Critical Study of Methods of Measuring Spermicidal Action, Ann. New York Acad. Sc. **54**: 806, 1952.

6a. In November, 1952, Dr. H. Mizuno of Nagoya University, Japan, told the author that he had independently measured and compared spermicidal times under similar conditions. A description in Japanese of his procedure has subsequently been included in the Second Report of the Committee on the Study of Health and Welfare of the Department of Health and Welfare of the Japanese Government, Kyoto, December, 1952.

7. For brevity the word jelly will be used to include jellies, creams, suppositories, and other semisolid contraceptive materials.

8. Friction of the walls of the tube as the jelly is forced in usually results in a cone at the end. The angle at the tip varies, but is usually about 120°. Variations in this angle may result in variations in the surface of the jelly to which the semen is exposed, but these do not appear extreme.

45° from the axis of the microscope. The position of the bulb is varied until the best possible view of the sperms is found. To avoid undue heating, the light is turned on (with a foot-pedal) only during moments of observation. A large opening in the microscope stage is convenient.

Motion of the sperms is observed through a 10x objective and 10x eyepiece. While the specimen is not being examined, it is kept in an incubator at 37 C, approximating vaginal temperature.

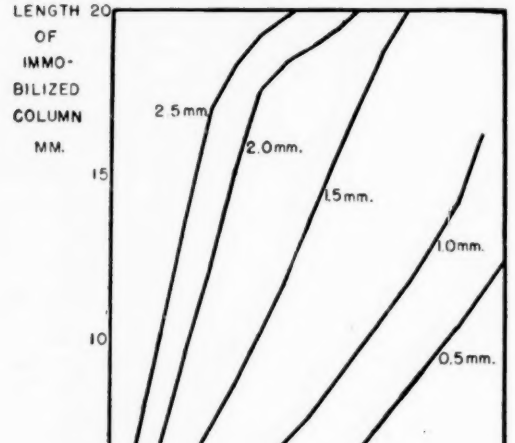

Fig. 1.—Length of semen column in which motility has been abolished compared with time. The semen columns are 20 mm. in length and 2.5, 2, 1.5, 1, and 0.5 mm. in diameter. The curves of the larger diameters are averages of four tubes each; that of the smallest of two tubes. All tubes were filled nearly simultaneously with portions of the same ejaculate and contraceptive material.

The period of time is recorded from the addition of the jelly to the immobilization of the last discoverable sperm that is closer to the jelly than the nearest portion of the meniscus; thus, motion within the angular portion of the semen next to the meniscus is disregarded. The contraceptive material that has the shortest immobilization time as thus determined (using portions of the same ejaculate) is presumed to be the most active.

AGE OF THE EJACULATE

As found in the Brown and Gamble test, the spermicidal time decreases as the ejaculate becomes older. For accurate comparisons, therefore, tubes should be filled at approximately the same time as well as with portions of the same ejaculate.

DIAMETER OF THE SEMEN COLUMN

When the jelly was in contact with the semen in the tube, it was found that the zone in which the sperms were immobilized gradually increased in length. When this rate of increase was compared, using the same brand of jelly and identical semen, but different diameters of tubes, it was found that within the limits tested (0.5 mm. to 2.5 mm.) it was higher in the larger tubes. Results of a typical experiment are given in figure 1. Repeated comparisons of a series of commercial contraceptives showed that their ranking was not significantly altered by changes in the diameter of the tube used.

To reduce the hours needed for observation, a larger tube is desirable, but it makes observation more difficult. To balance these two factors, a tube with a diameter of 2 mm. was chosen.

LENGTH OF THE SEMEN COLUMN

The effect of the length of the column of semen on the rate of immobilization was also explored. It was found that the shorter the column the more rapid the immobilization. Results of a typical experiment are given in figure 2. The ranking of contraceptive mixtures was not significantly dependent upon the length of semen column, provided the same length was used for each material.

Although a decrease in the column length has the advantage of shortening the observation period, it results in greater proportioned errors from variations in length. As a balance between these two factors, a length of 5 mm. was selected.

LENGTH OF THE JELLY COLUMN

If the column of jelly is too short, the toxic materials might be exhausted too early, leading to a longer immobilization time. However, since diffusion in the noncirculating fluid of the jelly is slow, this would not appear to be an important factor. Tests showed no significant difference in immobilization time between columns of the same jelly that were 3 mm. and 10 mm. long. However, lengths of approximately 10 mm. are customarily employed.

END-POINT

The time required for the zone of immobilization to reach any chosen distance from the jelly might be considered to be related to the contraceptive effectiveness of the jelly. Experiments using various distances up to and including the entire length of the column were performed. Results of these tests ranked commercial contraceptive mixtures in approximately the same order as did the other experiments. It was found somewhat easier to determine the time when there were no motile sperms nearer the jelly than the meniscus; consequently this time was chosen for the end-point.

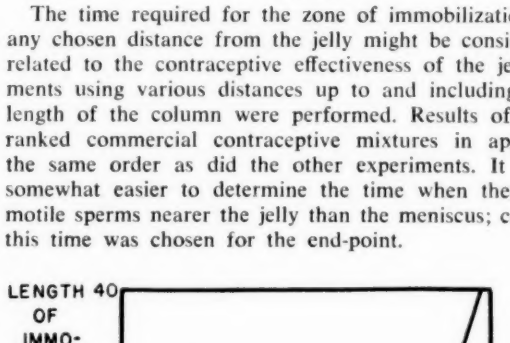

Fig. 2.—Length of semen column in which motility has been abolished compared with time. The semen columns are 1.6 mm. in diameter and 10, 20, 40, 60, and 80 mm. long. Each curve is drawn from a single experimental tube filled nearly simultaneously with the others with portions of the same ejaculate and contraceptive material.

POSITION OF THE SEMEN COLUMN

The position of the tube greatly affects the rate of extension of the zone where the sperms are immobilized. No important differences were found between the rates when the tubes were in the customary horizontal position and when they were 45 or 90° from the horizontal with the semen below the jelly. However, when the tubes were placed vertically with the

semen above, immobilization extended less than 1 mm. with even the most active jellies after six or seven hours of observation.

CONVECTION IN THE SEMEN

A flow of sperms and other seminal particles is observed in most of the tubes placed horizontally. This flow is usually toward the jelly in the higher levels of the semen (nearest the objective with the microscope in the customary position) and away from it when the focus is shifted to the lower levels. (A flow in the opposite direction is occasionally observed; at times there is no flow.) The flow appears to be laminar, moving slowly close to the surface; it first increases as the focus is shifted downward, then decreases as the center of the tube is approached. The flow moves more rapidly near the jelly, decreasing toward the other end of the semen column. It often decreases after hours of exposure to the jelly. Difficulties in measuring the depth of the focal plane below the inner surface of the glass have made it impossible to secure accurate comparisons of flows under varying conditions; however, flows as rapid as 1 mm. per minute have been observed.

The findings suggest that the flow is caused by convection. Diffusion of solutes out of the jelly usually makes the semen denser, causing it to sink and to be replaced by less contaminated semen. The spread of the spermicidal ingredients by convection is compatible with the greater rate of extension of the immobilized zone within the larger tubes (fig. 1), because the lesser surface friction of these tubes would allow more rapid circulation.

The theory of convection in the semen also makes understandable the slower rate of decrease of the zone of motility in the longer semen columns (fig. 2). This finding would not be expected if the dissemination resulted from diffusion alone. The entire semen column dilutes the immobilizing materials via circulation, thus delaying their reaching effective concentrations.

This conception also explains the slow spread of immobilization in vertical tubes in which the semen is above the jelly. In this position the lower portions of the semen, made denser by diffusion from the jelly, tend to remain in contact with it, and the toxic materials rise only by the relatively slow process of molecular diffusion. The fact that the immobilization rate is decreased when the semen in the tube is above the jelly would not seem to invalidate the test as an indicator of clinical accomplishment. Cases in which postcoital units of semen are exposed to jelly only on their underside would appear to be extremely rare. All other forms of contact will produce convection.

VARIATIONS IN SEMEN SPECIMENS

When portions of the same ejaculate were utilized in the method described, repeated determinations of spermicidal time showed standard deviations of a single observation of about 12%. In a series of 26 observations using one tube of jelly, with different donors and different ejaculates, the standard deviation of a single measurement was 38% of the average. For the 43 mixtures of 1951 reported in the table, of which all immobilizations were complete before seven hours, the average standard deviation of a single observation was 35% of the corresponding mean. Ejaculates from different donors produced greater variations in test results than the ejaculates from the same donor. The ejaculates from certain donors were consistently above average, whereas those given by others were consistently below average.

While this indicates that several tests with a given material are required to secure an accurate diffusion spermicidal time, single comparisons of two or more preparations tested with the same ejaculate will divide the range of contraceptive mixtures commercially available into a number of groups that are significantly different from each other in spermicidal activity.

SPERMICIDAL RANKING OF SEVENTY COMMERCIAL CONTRACEPTIVES

Semen specimens, secured from eight medical students 21 to 26 years of age, were used to determine the immobilization times of 68 commercial contraceptive preparations secured in 1951 and 2 in 1952. Twenty to 40 materials were compared in each experiment with portions of the same ejaculate, by one or two observers.

The experiments were customarily discontinued after seven hours of exposure of semen to jelly. If motility was still present at this time, the distance of the farthest motile sperm from the meniscus at the end of the semen column was recorded. A distance of 5 mm. indicates what motion was seen in the space surrounding the cone that forms at the jelly's tip.

Each commercial preparation was tested six or more times (at least twice by each observer) with semen from five or more different donors. In addition, by preparing the capillary tubes in the order of decreasing spermicidal times, materials of approximately equal activity were tested with portions of the same ejaculate which were of about the same age.

The average of all tests made of a given material is recorded in table 1, except for those preparations that showed motility in one or more tests at the end of seven hours. For these the median value is used. If this exceeded seven hours, the length of the semen column still showing motility is also given.

It seems unwise to commend secret mixtures, since there is no assurance that when these materials are secured in the future they will have the same composition as the samples tested. Materials whose complete formulas are not available, and whose immobilization times were less than 253 minutes (the median of the group) are listed in table 1 as materials A, B, C, and D.

The average standard deviation of 35% indicates that differences between two averages of the six or more observations given in table 1 are significant (less than 1 chance in 20 of being accidental) if they differ by more than 40% of their mean.[9] Since the longest observed times (more than 420 minutes) were more than nine times the shortest (46 minutes), the commercial preparations may be divided into several groups having significantly different spermicidal activities.

For an indication of the reproducibility of the test with different donors, spermicidal times similarly measured in 1950 and 1951, using the 1949 samples of the same materials with known formulas, are given in the third column of the table. Differences in the two average times for the 22 materials of which the formulas were known to be the same are, on the average, 18% of their means.

EXTRAPOLATION TO CLINICAL CONDITIONS

The spermicidal times from one-half hour to more than seven hours for complete immobilization in the columns of semen 2 mm. in diameter and 5 mm. long are obviously not those anticipated in clinical contraception. Experiments showed that these periods of time decreased to a few minutes as shorter semen columns were tested in tubes whose diameters were 2 mm. In the vagina the entire surface of the droplets is presumably exposed to jelly, which should decrease the time still further. The effective surface of the droplets may be increased by distortion from a spherical shape.

Although the immobilization times under clinical conditions will undoubtedly be much shorter than those given in table 1, the uncertainties regarding the size and shape of the droplets of semen in the vagina after coitus make it impossible to estimate these times with any exactness.

COMPARISONS WITH THE BROWN AND GAMBLE SPERMICIDAL TEST

Spermicidal times of the same samples of commercial contraceptive materials which were determined by the Brown and Gamble method are given in table 2. When ranking by this method is compared with that by the diffusion test (table 1), the correlation is not high. In many instances, mixtures that are more effective after dilution and mixing are less active when access to the sperms is by diffusion out of the jelly or cream and by convection throughout the adjacent semen.

Since the direct and undisturbed contact of semen and contraceptive material in the diffusion test more closely imitates clinical conditions than does the Brown and Gamble procedure, it is probable that the diffusion test gives a better

9. The relative accuracy of the ranking may be somewhat greater since most of the experiments were arranged to test with the same ejaculate in tubes filled at nearly the same time materials previously found to be adjacent on the scale.

10. Gelatin and agar each showed moderate immobilizing activity.

TABLE 1.—*Diffusion Spermicidal Times*

Material *	1951 Samples, Min.	Length of Semen Column in which Motility Continued, Mm.	1949 Samples, Min.	Length of Semen Column in which Motility Continued, Mm.
Rice, 30% sodium chloride	27	...	28	...
Material A †	46	...	...	...
Norforms	55	...	...	...
Rice, 20% sodium chloride	58	...	46	...
D. C. Jelly	71	...	...	...
Lactikol Jelly	77	...	...	...
Material B †	98	...	...	...
Metakol	100	...	...	...
Rice, 10% sodium chloride	101	...	113	...
Linton Jelly with Oxyquinoline sulfate	118	...	...	...
Zonitors	122	...	...	...
Marvosan Jelly ‡	122	...	148	...
Gelaquin 1952	126	...	...	...
Locorol	128	...	...	...
Material C †	130	...	...	...
LaSavoy	142	...	...	...
Gelakta 1952	144	...	...	...
Linton Jelly ‡	147	...	216	...
Verithol ‡	152	...	148	...
Femogene	154	...	...	...
Zylactic Jelly ‡	158	...	244	...
L. A. J.	160	...	...	...
Bilco Jelly	171	...	...	...
Vagagill ‡	175	...	197	...
Colagyn ‡	175	...	158	...
Cooper Creme Gel ‡	192	...	204	...
Koromex Jelly §	199	...	233	...
Material D †	204	...	...	...
Uni-Jel	204	...	...	...
Linton Cream ‡	220	...	174	...
Lorophyn Jelly	227	...	...	...
Warner's Suppository	227	...	...	...
Oxy-Zem ‡	238	...	173	...
Gyn-Jel	241	...	...	...
Bio-Lab Jelly	243	...	...	...
Vagagill Suppository	246	...	...	...
Uni-Cream	248	...	...	...
Servex	252	...	...	...
Ortho-Gynol Jelly	254	...	...	...
Penetrox Jelly	257	...	...	...
Milex Jelly	260	...	...	...
Arc Creme, Creemoz ‡	263	...	...	...
Cooper Creme §	263	...	261	...
Lorophyn Suppository §	278	...	236	...
Caprokol ‡	280	...	172	...
Lygenes Suppository §	280	...	...	...
Medi-phragm Jelly ‡	283	...	158	...
Marvosan Creme §	284	...	221	...
Hychex Jel	289	...	...	...
Veritas Kreme §	290	...	284	...
Contra Creme §	305	...	302	...
Stillman's Jell ‡	309	...	335	...
Lygel Jelly §	312	...	311	...
Certane Jelly	314	...	247	...
Preceptin	323	...	...	...
Lanteen Cream ‡	343	...	362	...
Penetrox Creme	356	...	...	...
Eugenic Creme ‡	357	...	406	...
Koromex Cream §	372	...	265	...
Ramses Jelly §	410	...	420	...
Lactikol Creme	411	...	...	...
Hychex Creme	420+	0.3	...	...
Arc Jelly, Jellak ‡	420+	1.6	420+	2.8
Pernox Capsule §	420+	1.8	...	...
Volpar Paste ‡	420+	2.7	420+	4.4
Murax Jelly ‡	420+	2.9	...	...
Certane Creme	420+	2.9	420+	4.3
Lanteen Jelly ‡	420+	3.1	420+	5.0
Nixon Creme ‡	420+	3.1	415	...
Bio-Lab Creme	420+	4.0	...	...
Milex Creme	420+	4.6	...	...
Glyeuthymenol Jelly ‡	420+	5.0	420+	2.2
Ortho-Creme §	420+	5.0	420+	5.0

* Unless otherwise indicated, complete or partial formula is given in addendum.

† Formula unavailable.

‡ Complete or partial formula in J. A. M. A. **148:** 50 (Jan. 5) 1952.

§ Formula in New and Nonofficial Remedies, 1951.

indication of the relative clinical effectiveness. A high ranking by both tests will give a "factor of safety," which seems desirable when contraceptive protection is important.

CHEMICAL FORMULAS OF THE MATERIALS TESTED

Each manufacturer was asked for permission to publish the formulas from which the contraceptive mixture was made. The information made available is indicated in table 1. To conserve space the formula is given in the addendum only when it is not available in previous publications. It is to be regretted that 26% are secret mixtures.

A SIMPLE CONTRACEPTIVE JELLY

The apparent convection resulting from increased density of the semen adjacent to the jelly suggested that the circulation of the spermicidal ingredients within the semen might be accelerated by adding a density-producing solute to a jelly. Therefore, sodium chloride was incorporated (with mortar and pestle) in one of the less rapidly immobilizing materials and was found to greatly increase its apparent activity.

TABLE 2.—*Spermicidal Times* by the Method of Brown and Gamble of Contraceptive Jellies and Creams Secured in 1951*

Five Minutes or Less

Arc Jelly, Jellak	Koromex Jelly	Norforms
Bilco Jelly	Lactikol Creme	Ortho-Creme
Bio-Lab Creme	Lactikol Jelly	Ortho-Gynol Jelly
Certane Creme	L.A.J.	Penetrox Jelly
Colagyn	Lanteen Jelly	Preceptin
Contra Creme	Linton Cream	Ramses Jelly
Cooper Creme	Lorophyn Jelly	Vagagill Suppository
D.C. Jelly	Lorophyn Suppository	Veritas Kreme
Eugenic Creme	Lygel Jelly	Zonitors
Femogene	Marvosan Creme	Zylactic Jelly
Hychex Jel	Metakol	
Jellak	Milex Creme	
Koromex Cream	Milex Jelly	

Product	Min.	Product	Min.
Gelakta '52	6	Vagagill	19
Warner's Suppository	6	Certane Jelly	25
Nixon Creme	7	Uni-Jel	30
Bio-Lab Jelly	8	Volpar Paste	33
Lanteen Cream	8	Lygel Suppository	36
Oxy-Zem	8	Arc Creme, Creemoz	51
Verithol	8	LaSavoy	64
Hychex Creme	10	Rice Flour + 30% sodium chloride	92
Pernox Capsule	10	Locorol	100
Caprokol	11	Marvosan Jelly	118
Gelaquin '52	11	Linton Jelly with Oxyquinoline sulphate	137
Cooper Creme Gel	12	Rice Flour + 20% sodium chloride	211
Medi-Phragm	12	Glyeuthymenol Jelly	240+
Penetrox Creme	12	India Gyn-Jel	240+
Warner's Creme	14	Linton Jelly	240+
Uni-Cream	19	Murax Jelly	240+
		Rice Flour + 10% sodium chloride	240+
		Stillman's Jell	240+

* Each time is the median of 5 or more determinations with semen from five different donors.

Because Voge [3] found that 3.4% sodium chloride in a semen mixture immobilized in 10 minutes, it seemed that the action might be caused by this salt's activity. Therefore, various concentrations were added to a 5% tragacanth jelly, a mixture which by itself was found to have little or no immobilizing power.[10] A concentration of 10% sodium chloride in 5% tragacanth was found to immobilize the spermatozoa as well as did nine-tenths of the commercial contraceptives.

The possibility of preparing a homemade spermicidal jelly from a readily obtainable material was investigated. It was found that rice flour and water heated nearly to boiling for 30 minutes in a double boiler, with stirring, produced a jelly with a consistency approximating that of commercial contraceptives when the initial concentration was between 12 and 17% of the water by weight. Wheat and other flours, gelatin, and other jelly-producing substances may also be used; rice flour was chosen for the test with the thought that it would be widely available in countries in which population control is intensely needed.

The immobilizing activities of jellies containing sodium chloride in a concentration of 0.1, 0.2, and 0.3 of the water by weight were tested and found to be among the more active commercial products (table 1).

Such rice flour and salt jellies in which the sodium chloride was 10 and 20% of the water were tested at the Margaret Sanger Research Bureau by three women. Daily vaginal doses of 5 cc. each for 21 days did not cause subjective discomfort or evidence of irritation upon speculum examination.

When the rice flour jelly was kept at room temperature in the laboratory, it usually turned sour in a few days. A jelly made with three times the recommended concentration of rice flour and salt has been found to last weeks at room temperature and to give a satisfactory consistency when diluted with twice its volume of cold water. Stirring for 3 or 4 minutes, followed by a lapse of 15 or more minutes and a slight amount of further stirring, was found to be desirable.

It seems probable that a solution of sodium chloride, of 10% or stronger, will act as an effective spermicide. A rubber or marine sponge, a wad of cotton, or a pad of cloth can hold it in the vagina. It should be inserted before intercourse and retained for a sufficient period thereafter to allow immobilization of the sperm.

SUMMARY

Clinical tests of contraceptive materials are unsatisfactory because of variations in the regularity of their use. Most laboratory tests which have been used to give indications of clinical effectiveness have been based on dilution and complete mixing, neither of which is present to the same extent in clinical use. A method is described for observing the immobilization of sperm in semen in direct contact with undiluted contraceptive jelly, cream, or suppository. Using the test with semen columns 2 mm. in diameter and 5 mm. long, commercial contraceptive preparations have been compared and their rankings are given. It is concluded that density convection within the semen, caused by diffusion into it of ingredients of the contraceptive jelly, is an important process in contraceptive action. A jelly having high spermicidal activity by this test was prepared by heating and stirring together sodium chloride, rice flour, and water.

ADDENDUM

1. Complete quantitative formulas were supplied by the manufacturers for the following products:

	%
Bilco Jelly, 1951	
Cetyl dimethyl benzyl ammonium chloride	0.05
Para-tert. amyl phenol	0.15
Lactic acid	1.0
Glycocoll	0.10
Methyl-p-hydroxybenzoate	0.05
Propyl-p-hydroxybenzoate	0.05
Boric acid	1.0
Glycerin	12.0
Gum tragacanth	1.20
Gum Carob	2.50
Bio-Lab Jelly, 1951	
Phenylmercuric borate	0.017
Oxyquinoline sulfate	0.08
Boric acid	1.00
Glycerin	5.75
Gum tragacanth	4.25
Adjusted with lactic acid to pH 4.5	
B. C. Jelly, 1951	
Chlorothymol	0.015
Paraformaldehyde	0.20
Lactic acid U.S.P. to adjust pH to 3.655	
Propyl-p-hydroxybenzoate	0.20
Glycerin	16.0
kelcolloid	0.45
Pectinum N.F.	4.0
Femogene, 1951	
Lactic acid	1.0
Oxyquinoline sulfate	0.075
Boric acid	3.0
Glycerin	5.0
Tragacanth	2.0
Disodium phosphate to approximate pH 4.0	
Gelakta, 1952	
Cetyl dimethyl benzyl ammonium chloride	0.1
Para-tert. amyl phenol	0.2
Lactic acid	1.5
Boric acid	1.0
Glycocoll	0.10
Methyl-p-hydroxybenzoate	0.05
Propyl-p-hydroxybenzoate	0.05
Glycerin	12.0
Gum tragacanth	1.20
Gum carob	2.50
Gelaquin, 1952	
Para-tert. amyl phenol	0.1
Oxyquinoline sulfate	0.1
Lactic acid	1.0
Boric acid	1.0
Glycocoll	0.1
Methyl-p-hydroxybenzoate	0.05
Propyl-p-hydroxybenzoate	0.05
Glycerin	15.0
Gum tragacanth	1.2
Gum carob	2.5
Lactikol Creme, 1951	
Glyceryl monoricinoleate	1.50
Sodium lauryl sulfate	0.60
Lactic acid	0.10
p-Triisopropylphenoxypolyethoxyethanol	1.25
Glycerin	8.0
Glyceryl monostearate	7.50
Stearic acid	15.0
Lactikol Jelly, 1951	
Glyceryl monoricinoleate	1.0
Sodium lauryl sulfate	0.20
Oxyquinoline sulfate	0.05
Lactic acid	1.50
p-Triisopropylphenoxypolyethoxyethanol	1.25
Butyl-p-hydroxybenzoate	0.02
Glycerin	8.0
Acacia	1.0
Karaya	1.0
Tragacanth	2.70
L. A. J., 1951	
Cetyl dimethyl benzyl ammonium chloride	0.1
Para-tert. amyl phenol	0.15
Lactic acid	1.0
Glycocoll	0.10
Methyl-p-hydroxybenzoate	0.05
Propyl-p-hydroxybenzoate	0.05
Boric acid	1.0
Glycerin	15.0
Tragacanth	0.9
Carob gum	2.25
Starch	5.35
LaSavoy Jelly, 1951	
Chlorothymol	0.01
Lactic acid	2.4
Oxyquinoline sulfate	0.054
Boric acid	0.25
Starch	5.25
Gum tragacanth	1.05
Glycerin	65.8
Linton Jelly Oxyquinoline, 1951	
Formula in reference 4 plus Oxyquinoline sulfate	0.1
Locorol, 1951	
Aluminum aceto tartrate	3.125
Oxyquinoline sulfate	0.95
Boric acid	2.345
Glycerin	28.70
Gum tragacanth	1.70
Lorophyn, 1951	
Phenylmercuric acetate	0.05
Polyethylene glycol of monoisooctylphenyl ether	0.3
Methyl-p-hydroxybenzoate	0.05
Sodium borate U.S.P.	3.0
Glycerin	8.0
Calcium carragheen sulfate	0.72
Tragacanth	1.8
Metakol, 1951	
Glyceryl monoricinoleate	1.0
Sodium lauryl sulfate	0.2
p-Triisopropylphenoxypolyethoxyethanol	1.25
Boric acid	3.0
Glycerin	7.0
Gum arabic	0.5
Karaya	1.0
Tragacanth	2.0
Norforms, 1951	
Phenylmercuric acetate	0.02
Benzethonium chloride	0.20
Methyl-p-hydroxybenzoate	0.10
Sorbitan sesquioleate	5.0
Carbowax 1000	80.0
20 dendro palmitic acid	14.68
Ortho-Gynol, 1951	
p-Di-isobutylphenoxypolyethoxyethanol	1.0
Ricinoleic acid	0.70
Oxyquinoline sulfate	0.025
Acetic acid	0.33
Boric acid	3.0
Propyl-p-hydroxybenzoate	0.05
Glycerin	5.0
Acacia	2.0
Tragacanth	3.0
Glycerin	15.0
Tragacanth	0.9
Carob gum	2.25
Starch	5.35
LaSavoy Jelly, 1951	
Chlorothymol	0.01
Lactic acid	2.4
Oxyquinoline sulfate	0.054
Boric acid	0.25
Starch	5.25
Gum tragacanth	1.05
Glycerin	65.8
Linton Jelly Oxyquinoline, 1951	
Formula in reference 4 plus Oxyquinoline sulfate	0.1
Locorol, 1951	
Aluminum aceto tartrate	3.125
Oxyquinoline sulfate	0.95
Boric acid	2.345
Glycerin	28.70
Gum tragacanth	1.70
Lorophyn, 1951	
Phenylmercuric acetate	0.05
Polyethylene glycol of monoisooctylphenyl ether	0.3
Methyl-p-hydroxybenzoate	0.05
Sodium borate U.S.P.	3.0
Glycerin	8.0
Calcium carragheen sulfate	0.72
Tragacanth	1.8
Metakol, 1951	
Glyceryl monoricinoleate	1.0
Sodium lauryl sulfate	0.2
p-Triisopropylphenoxypolyethoxyethanol	1.25
Boric acid	3.0
Glycerin	7.0
Gum arabic	0.5
Karaya	1.0
Tragacanth	2.0
Norforms, 1951	
Phenylmercuric acetate	0.02
Benzethonium chloride	0.20
Methyl-p-hydroxybenzoate	0.10
Sorbitan sesquioleate	5.0
Carbowax 1000	80.0
20 dendro palmitic acid	14.68
Ortho-Gynol, 1951	
p-Di-isobutylphenoxypolyethoxyethanol	1.0
Ricinoleic acid	0.70
Oxyquinoline sulfate	0.025
Acetic acid	0.33
Boric acid	3.0
Propyl-p-hydroxybenzoate	0.05
Glycerin	5.0
Acacia	2.0
Tragacanth	3.0
Rice Flour—10% sodium chloride	
Rice Flour	11.3
Sodium chloride	8.06
(the sodium chloride is 10% of the water)	
Rice Flour—20% sodium chloride	
Rice Flour	10.4
Sodium chloride	14.9
(the sodium chloride is 20% of the water)	
Rice Flour—30% sodium chloride	
Rice Flour	9.7
Sodium chloride	20.8
(the sodium chloride is 30% of the water)	
Servex, 1951	
Sodium lauryl sulfate	0.1
p-tert. amylhydroxy benzene	0.15
Boric acid	1.0
Butyl-p-hydroxybenzoate	0.02
Alcohol U.S.P.	5.0
Glycerin	8.0
Uni-Cream, 1951	
Phenylmercuric acetate	0.02
Oxyquinoline benzoate	0.02
Cetyl alcohol	1.0
Boric acid	2.0
Butyl-p-hydroxybenzoate	0.20
Glycerin	5.0
Sorbitan monoleate	5.0
Polyoxyalkalene sorbitan monostearate	3.0
Stearic acid	20.0
Uni-Jel, 1951	
Trioxymethylene	0.04
Dioctyl sodium sulfosuccinate	0.50
Lactic acid	0.09
Sodium oleate	0.67
Trihydroxyethylamine	10.5
Cellulose gum	11.0
Vagagill Suppository, 1951	
Phe-Mer-Nite, a brand of Phenylmercuric nitrate	0.02
Oxyquinoline sulfate	3.85
Acetic acid	3.85
Boric acid	19.2
Cocoa Butter	73.1
Warner's Suppository, 1951	
Oxyquinoline benzoate	0.2
Boric acid	13.9
Salicylic acid	2.8
Lactic acid	0.2
Benzocaine	trace
Cocoa butter white wax	82.9
Zonitors Suppository, 1951	
Stearic acid	0.25
Chloramine-T	2.00
Sodium stearate	6.00
Potassium stearate	2.50

2. For the following products, the available information was limited to the "active ingredients" recorded on the package:

	%
Bio-Lab Creme, 1951	
Phenylmercuric borate	....
Oxyquinoline sulfate	....
Triethanolamine	....
Stearic acid	....
Glycerin	....
Propylene glycol monostearate	....
Certane Creme, 1951	
Phenylmercuric acetate	0.02
Sodium sulfo dioctyl succinate	....
Chlorothymol in a Stearate base	....
Certane Jelly, 1949, 1951	
Phenylmercuric acetate	0.02
Boric acid	....
Oxyquinoline sulfate	....
Sodium sulfo dioctyl succinate	....
Hychex Creme, 1951	
Phenylmercuric borate	0.0175
Oxyquinoline sulfate	0.08
Triethanolamine	....
Stearic acid	....
Glycerin	....
Propylene glycol monostearate	....
Hychex Jel, 1951	
Phenylmercuric borate	0.0175
Lactic acid	....
Boric acid	....
Borax	....
Oxyquinoline sulfate	0.08
Milex Creme, 1951	
Glycerol ester of ricinoleic acid	0.50
Sodium lauryl sulfate	0.60
Oxyquinoline sulfate	0.02
Adjusted with lactic acid to pH 4.5	....
Milex Jelly, 1951	
Glycerol ester of ricinoleic acid	0.50
Oxyquinoline benzoate	0.10
Adjusted with lactic acid to pH 4.5	....
Penetrox Creme, 1951	
Glycerol ester of ricinoleic acid	1.50
Sodium lauryl sulfate	0.60
Oxyquinoline sulfate	0.02
Adjusted with lactic acid to pH 4.5	....
Penetrox Jelly, 1951	
Glycerol ester of ricinoleic acid	1.25
Oxyquinoline benzoate	0.10
Adjusted with lactic acid to pH 4.5	....
Preceptin, 1951	
p-Di-isobutylphenoxypolyethoxyethanol	1.0
Ricinoleic acid	1.17

3. For the following product, the manufacturers gave a quantitative formula which appears complete except for the jelly-forming material:

Gyn-Jel (Bombay)		
Phenylmercuric nitrate	0.02	In a water-dispersible, self-emulsifying synthetic base ....
Boric acid	2.50	

THE POSTCOITAL TEST AS A METHOD OF EVALUATING A CONTRACEPTIVE JELLY

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In the past 20 years, several birth control studies have been made at Mandel Clinic of Michael Reese Hospital, utilizing jelly alone as a contraceptive measure. In 1932 Stein [1] conducted such a study lasting three years, and during the course of the active clinic no pregnancies occurred among the 146 patients in that particular series. Ten years later, Stein, Nielsen, and one of us (M. R. C.)[2] reported on another three year study using the jelly alone. This survey included 231 patients who were interviewed in the clinic over a period lasting from 3 to 36 months. A total of 20 pregnancies could be charged solely to the method utilized in this second series. This study showed that the effectiveness of the method using jelly alone to be an 87.1% reduction in fertility. Since 1942 several reports have been made on the efficiency of the nonmechanical means of contraception, including jelly, cream, and suppositories. The authors of these articles reported that the use of these methods resulted in 85 to 100% reduction in fertility.[3] From a review of the literature of the past 20 years and from our own experience, it is apparent that nonmechanical means can be effective as contraceptive methods.

In the present survey, we utilized what we consider a more scientific and reliable method for testing the efficacy of a specific contraceptive jelly than has been used in former studies. This method is the postcoital examination made after the use of the contraceptive. We feel that this is an effective means of evaluation since spermicidal action was tested at that period of the menstrual cycle when cervical mucus demonstrated greatest receptivity to spermatozoa. The pregnancies that can be charged against a contraceptive per se, eliminating all other factors, can be better estimated by the positive postcoital tests.

The purpose of this study was threefold: (1) to utilize a heretofore untried objective method of evaluating the effect of an experimental jelly on the longevity of spermatozoa, (2) to determine the effect of this jelly upon cervical mucus, and (3) to evaluate this experimental jelly as a contraceptive.*

In our special birth control clinic, 200 patients were instructed in the method using jelly alone. Of these, 158 patients returned to the clinic for at least one visit over a period of 3 to 18 months. The clientele consisted chiefly of postnatal patients and certain women referred because of medical indications. The group consisted of 95% Negro and 5% white women. Thirty-seven patients had used various birth control measures previously. The chief methods employed were diaphragm and jelly (18 patients) and condom (14 patients). Of these patients 9 and 12 respectively stated that the methods had been successful but had been discontinued for personal reasons.

CLINICAL DATA

The patients were interviewed and examined gynecologically before birth control instruction was given. In addition to past medical, surgical, and obstetric history, an inquiry was made regarding previous contraceptive methods and sex habits. A calendar card was issued to each patient with instructions to mark the dates of menses and of coitus. A symbol was to be placed over the date of intercourse, indicating the date on which the clinic contraceptive was used. If no contraceptive was used, the date was to be circled. Each patient was individually instructed in the proper technique as follows. A 5 cc. applicator was to be filled completely with the jelly, inserted into the vagina as high as possible, withdrawn about 1 inch., and the plunger pushed in all the way so as to place the jelly in the upper vagina, close to the cervix. Each patient was cautioned to insert the jelly while lying in a horizontal position, 5 to 10 minutes prior to each coitus. An optional douche was permitted after a minimum of six hours following coitus. Patients were seen within a week after instruction. Whenever possible, the examination was made a few hours after coitus. Examination at this time and at subsequent one to three month intervals included pelvic examination, with particular attention to the study of vaginal and cervical contents. A vaginal speculum was inserted without lubrication, exposing the cervix and the posterior fornix. A small quantity of the vaginal secretion from the posterior fornix was diluted with saline and the smear of this material examined for spermatozoa, leukocytes, trichomonads, and monilia. The cervical mucus at the external os was removed with tissue forceps. After the cervical mucus was removed, a curved glass cannula was inserted into the cervix for aspiration of the endocervical contents. Occasionally, intrauterine samples were aspirated. The cervical mucus was studied macroscopically as to the amount (1 to 4+), viscosity (thin, moderate, or thick), fibrosity *(Spinnbarkeit)*, and flow elasticity. The same specimens were examined microscopically for spermatozoa and leukocytes.

Spinnbarkeit,[4] which is the capacity of the cervical mucus to be drawn into a thread, shows cyclic variations during the menstrual cycle. At the estimated ovulation time, the cervical mucus becomes thin, profuse, glairy, and will show the greatest degree of *Spinnbarkeit* (usually 10 to 20 cm. in length). At this phase of maximum *Spinnbarkeit*, the longevity of spermatozoa is optimal. It is at this time that a contraceptive must be most effective. Therefore, we attempted to test the efficacy of Experimenal Jelly "P" at the estimated ovulation time, utilizing *Spinnbarkeit* and the menstrual calendar as the criteria of ovulation.

RESULTS

A total of 289 postcoital tests was performed on the 158 patients. These tests were done 2 to 72 hours postcoitus. Of the 289 postcoital tests, 173 (59.8%) revealed no sperm, 110 (38.1%) examinations showed nonmotile sperm, and motile sperm were found in only 6 (2.1%) examinations (table 1). These positive findings occurred in 5 women, twice in the same patient. Three women stated that they had not followed the exact instructions regarding the technique.

The mucus obtained at the external os after the use of Experimental Jelly "P" was almost invariably thick and plastic and showed a *Spinnbarkeit* of 1 cm. or less. These physical characteristics of cervical mucus are inimical to sperm motility. However, when this thickened mucus was removed with tissue forceps and the endocervix aspirated, the endocervical mucus was found to be consistently characteristic of the phase of the cycle at which it was obtained. In other words, if the jelly itself produced mucus coagulation, this effect was in the zone of contact and did not penetrate to the endocervix.

From the Department of Obstetrics and Gynecology, Michael Reese Hospital.

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* Experimental Jelly "P" was supplied by Ortho Research Foundation.

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A total of 200 patients, chiefly postnatal, were instructed in the method using jelly alone. Of the total, 158 patients returned for 1 to 12 follow-up visits. In this group, 30 pregnancies occurred. However, 23 of this group of 30 women admitted to omission of the method, incorrect or inconstant use, or the use of some other contraceptive technique. Eighty-three women were followed for a period extending from 3 to 18 months. Eighteen of these 83 women became pregnant. Of the 18, 3 omitted contraception; 3 admitted to inconstant use of the jelly; 3 failed to follow instructions properly, and 2 switched to another method. Thus, there were 7 pregnancies which might be attributed to failure of the method (table 2).

In computing the pregnancy rate, only those patients who had been followed for at least three months were included. Some patients were seen for the first time shortly before termination of the clinic and others only on their check-up visit one week after instruction. Therefore, the pregnancy rate was computed on the basis of 7 pregnancies out of the group of 83 women who were followed at least three months. The gross pregnancy rate of this group before admission to the clinic was high: 103.15 pregnancies per 100 woman-years of exposure. The corrected rate of jelly failure was 17.46 pregnancies for 100 woman-years of exposure. Therefore, for the method using jelly alone, the reduction in fertility was 83.17%.

Many patients objected to the messiness of the method. Only rarely did they complain of diminished erotic reactions.

COMMENT

The effectiveness of any contraceptive measure depends upon its spermicidal qualities and regularity of use. Through ignorance and the caprice of human nature, any group of patients, private or clinical, will present a certain percentage of failures. Previous clinical studies have shown fairly high percentages of pregnancies with relatively few actually resulting from failure of the method itself. The corrected figures for our clinic compare favorably to those published by Stein,[2b] and Finkelstein.[3h] However, the results of our study are not as favorable as those reported by two other groups of investigators who used Preceptin † in their clinics.[3i,j]

The effectiveness of accepted spermicides in general use has been tested repeatedly in vitro. In this study, the use of an experimental jelly tested in vivo has been reported. The effectiveness in vivo of the jelly can be evaluated by examining vaginal and cervical secretions for living spermatozoa following coitus. In utilizing the postcoital test, we hoped to determine whether the failures resulted from the actual failure of the method as a spermicide or to the human element of possible omission or misapplication of the method.

TABLE 1.—*Positive Postcoital Tests Following Use of Experimental Jelly "P"*

Patient No.	Day of Cycle	Hours Post Coitus	Mucus		White Blood Cell/ High Power Field	Sperm/ High Power Field	% Motility	Grade	Comment
			Amount	Viscosity					
15	19	13	C* 2+	Moderate	100	Occasional	0	0	Jelly inserted while in bathroom; patient walked to bed; took douche in a. m.
			E † 2+	Moderate	5-10	1-2	90	3	
15	17	12	C 2+	Moderate	50	0	0	0	Patient reinstructed in use of jelly but still had positive test
			E 2+	Moderate	Occasional	Occasional	75	1, 2	
22	18	36	C 1+	Thick	12	2	0	0	Jelly inserted while in bathroom; pregnancy followed this exposure
			E 2+	Moderate	6	100	90	4	
35	21	34	C 2+	Thin	25	2-3	0	0	.....
			E 4+	Thin	5-10	10	90	3, 2	
45	62 Lactation	11	C 1+	Moderate	25	5	50	1, 3	.....
			E 2+	Thick	20	3	25	1	
70	16	12	C 1+	Moderate	Occasional	0	0	0	Jelly inserted while in bathroom; took douche in a. m.
			E 2+	Moderate	Occasional	2	50	3	

* External os of cervix. † Endocervical canal.

Side-Effects.—The chief complaint against the contraceptive jelly was that of burning during and after its use. A total of 49 persons complained of local burning with the use of the jelly; this included both male and female. Some of these complaints were made by only one partner; in some instances, both partners complained. Twelve women who reported this symptom were found to have monilial vaginitis; when this was treated, the complaint of burning ceased. In 5 patients, moniliа-like organisms were found in the absence of any complaints. Some patients reported burning when the jelly was first used, but stated that with continued use the burning sensation disappeared. Because of these side-effects, the formula of Experimental Jelly "P" has been changed to incorporate a new buffer system.

TABLE 2.—*Causes and Number of Pregnancies*

Causes	Number of Pregnancies
Jelly failures	7
Failure to use jelly as directed	3
Inconstant use of jelly	8
Condom failure	2
Omission of all birth control	10
Total	30

Since the postcoital method is a sampling technique, it is liable to error. There was an incidence of 2.1% positive postcoital tests (motile sperm) in a total of 289 examinations. It is possible that living sperm were present in other cases but were not found by the sampling technique.

SUMMARY

The effectiveness of the method using jelly alone compares favorably with the results published by other investigators who studied similar methods. Experimental Jelly "P" was employed in a group of 158 clinic patients. An 83.17% reduction in fertility resulted. However, acceptance of the method by the patients was poor; less than one-half of the women were reporting to the clinic at the time the study terminated.

Experimental Jelly "P" showed only a superficial coagulating effect upon cervical mucus, and there was no evidence of penetration into the cervical canal.

What was considered a more scientific and reliable method for testing the efficacy of a spermicidal jelly was tried: the in vivo examination of cervical contents following the use of a specific contraceptive. At the conclusion of this study, we were satisfied that the postcoital test is accurate and should be utilized more widely in the evaluation of spermicidal preparations used as contraceptives.

† Preceptin has a different buffer system than Experimental Jelly "P."

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MEDICAL EDUCATION FOUNDATION REPORTS PROGRESS

The recently published second annual report of the American Medical Education Foundation indicates that 16% of the medical profession in the United States contributed more than 3 million dollars to medical education during 1952. The report clearly shows the medical profession's growing acceptance of the Foundation's fledgling program and the determination of the profession to assist the nation's medical schools in their fight to attain financial solvency. Notable interest in the Foundation's program during 1952 was evidenced by a 287% increase in the number of contributors, from 1,876 in 1951 to 7,259 in 1952. Contributions by individuals to the Foundation during 1952 amounted to $291,000, a 210% increase over 1951, and total contributions amounted to $906,553.

With the cooperation of the medical schools, the Foundation's report lists, for the first time, the names of 30,808 individual physicians who made unrestricted gifts directly to the medical schools last year. Names are listed alphabetically by state of residence, and the school receiving the contribution can be identified easily by a code number following each physician's name. Direct gifts to medical schools by physicians in support of teaching programs during 1952 totaled approximately $2,250,000.

According to the report, strong support of the Foundation was found particularly in eight states in which 15% or more of the physicians made contributions. Nebraska led all states, with a total of 27.93% of her physician population contributing to the Foundation. Indiana, South Dakota, Vermont, Wyoming, New Hampshire, Connecticut, and Delaware, in that order, were the other leaders in the group of eight. While these percentages seem impressive at first glance, the over-all picture is still far short of the optimum support needed from members of the medical profession to relieve the financial strain under which our medical schools operate today.

The medical schools are among the nation's greatest bulwarks for freedom, but they are heavily dependent upon physicians for support. Without the individual support of every member of the medical profession, the schools will be forced to lower the quality of teaching programs, which ultimately will result in poorly trained physicians. Inadequately trained physicians will mean inadequate medical service for the American public.

Every physician in the United States should read the second annual report of the American Medical Education Foundation and make a careful survey of his or her charitable contributions and include the Foundation. A more worth-while cause than that of keeping the nation's medical schools operating at current high standards cannot be found. Recently President Eisenhower said, "Only if our medical schools remain financially solvent can we hope to place medical education on a sound basis, free from the threat of government-sponsored plans or schemes to control it."

The American Medical Education Foundation is a "physician's foundation," organized for the benefit of the medical schools that will supply future members to the profession. It deserves the wholehearted support of every physician in the United States. Individual members of the profession who have worked on committees at personal sacrifice for the Foundation's program during the last two years are to be commended for their successful efforts to help alleviate the financial strain in medical education today. If this group of busy, practicing physicians can take time from their leisure hours to do the arduous committee work connected with the development of the Foundation, all members of the medical profession can and should help by making a gift to the Foundation. Physicians may make a contribution earmarked for the school of their choice or to the general fund. No matter which method is chosen, it will help the Foundation attain its annual goal of 2 million dollars and help insure the continued freedom and solvency of the medical schools.

MISTREATED CHILDREN

From time to time pictures appear in newspapers showing children who have been treated inhumanely by their parents. In a newspaper with a large circulation through much of the United States there recently was published a photograph of a 12-year-old boy with a chain around his neck. He had been chained to a chair by his father because he displeased this parent.

Such public display of children is not uncommon. Obviously it is newsworthy and may, of course, arouse local indignation so that punishment befitting the crime is effected. It does not, however, help the unfortunate victims. If a child is guilty of an offense against society he must expect to receive some punishment. If, on the other hand, he is subjected to mistreatment, especially if it is not his fault, he should not be exposed deliberately to the ridicule, taunts, and even well meant but cutting sympathy that follows his being placed before the spotlight of publicity. A report of the story is one thing, but an accompanying picture by which the child can be

identified even by strangers is another. If he is a normal child his life may well be profoundly affected by such bids for the attention of a news-hungry public.

Anyone who has worked with children in camps, clubs, or schools will know of the sensitive responses often observed in boys and girls. There are few children who do not feel deeply hurt when they believe they have been betrayed by their parents or, for that matter, by their teachers and group leaders. They are especially troubled when this betrayal means they are held up to ridicule. Sometimes the hurt is controlled without harm to anyone, but too often it results in spiritual and even physical rebellion that leads to serious trouble.

The social and psychiatric aspects of this type of commercial exploitation of children can best be discussed by those who are experts in such fields. Physicians in general, however, work closely with children, not just in their practices but in other activities sponsored by clubs, churches, youth organizations, and schools. From time to time they have encountered situations in which they have longed for the opportunity to prevent some children from being ridiculed publicly. They know that it is much easier to prevent deep resentment than to attempt to correct the results of it. They also know, perhaps better than others, the need for careful counseling as boys and girls are passing through their formative and most impressionable years. Perhaps a few words from doctors addressed quietly to responsible persons may prevent at least occasionally the unnecessary public display and exploitation of some boy or girl whose only crime is to have the wrong parents.

MEDICAL HELP FOR INDIA

During the recent convention of the American Medical Association the Board of Trustees endorsed a joint project of CARE and the World Health Organization to provide needed equipment and supplies to India and neighboring countries. The Trustees' action was followed by one by the Woman's Auxiliary, which adopted a resolution that also pointed up the need for such improved medical services. The project offered by CARE and the World Health Organization is based on a recent WHO survey that established that in India alone there are some 80 hospitals, medical schools, nursing schools, and similar institutions, and 210 more in neighboring countries, with a total of some 42,000 beds, which are in urgent need of the most basic supplies, including bed linen; surgical instruments; simple laboratory equipment; and textbooks on materia medica, pathology, latest surgical and treatment techniques, and similar subjects. A hospital for patients with tuberculosis in Ceylon, for instance, was found to be lacking sterilization equipment for instruments and utensils and for the notoriously bad drinking water of the community. Two natives were kept busy boiling water all day to meet the need. A nursing school in India was providing all of its instruction with the aid of a single anatomic atlas, dog-eared with age; its request was for books, "just one textbook each on public health, nursing techniques, therapeutical methods, etc." The Ramakrishna Hospital in East Rangoon, which treated more than 76,000 patients last year, not counting patients readmitted, has 16 physicians on its staff, only 4 of whom, the residents and interns, are paid. The other 12 serve gratuitously at the hospital and help make up the constant deficit of the institution with the income from their private practice.

The individual physician of India, Burma, and Thailand often is lacking in health tools which the abject poverty of his country prevents him from obtaining. Where large portions of any population are subjected to constant hunger and want, the health standards of a nation are bound to suffer, not merely as the result of general malnutrition, but because of the lowered resistance to all forms of disease, whether epidemic or endemic in nature. Help in such instances is especially appreciated and of almost incalculable value.

USE OF THE METRIC SYSTEM

The scientific publications of the American Medical Association for some years have favored the use of the metric system. The Council on Pharmacy and Chemistry uses only this system for its books, and for THE JOURNAL, the metric system is preferred. The advantages of using the metric system are many and have been mentioned in earlier issues of THE JOURNAL. These advantages accrue to the medical profession, pharmacy, the drug industry, and to the patient.

The United States Pharmacopeia and the National Formulary, which are official compendiums for the United States, give preference to the metric system. Only in the United States, Canada, and Great Britain is the apothecary system used extensively. And even in the United States it is being used less each year because of the teaching in medical schools and because the drug industry is labeling its newer products with metric weights and measurements. Thus it seems to be only a matter of time before the apothecary system is largely discarded in this country.

This progress should be encouraged for practical reasons, which include those associated with economics and with safety in prescribing. According to a survey made by *Drug Topics*, a journal primarily of interest to pharmacists and the drug industry, more than 68% of physicians and pharmacists desire increased use of the metric system. Unfortunately, some of the pharmacists believed this system was not growing in favor. Others, however, asserted it was being used more extensively and referred particularly to increased use by general practitioners. The survey revealed at least some reason for hoping that the day when the metric system will be exclusively used is closer, but it also indicated a real need for those in favor of this more scientific and exact system to use every means to encourage its general adoption. It may take time, but it will be worth the effort.

ORGANIZATION SECTION

COMMITTEE ON LEGISLATION

At its meeting April 3-4, 1953, the Committee on Legislation took action on 75 legislative measures introduced in the 83rd Congress, recommending either approval or disapproval. All of the recommendations were approved by the Executive Committee of the Board of Trustees on April 26, 1953. Following is a brief résumé of these bills grouped according to subjects, together with the position adopted by the Association in each instance.

MEMBERS OF THE ARMED SERVICES OR THEIR DEPENDENTS

S. 33

Introduced by Mr. McCarran of Nevada and referred to the Senate Committee on Armed Services.

Digest of Bill.—The bill would authorize hospitalization and medical and dental care for members of the Coast Guard and their dependents in United States Naval hospitals and dispensaries when such care is not available from the United States Public Health Service.

Association Position.—The Association **actively opposes** the bill, because, in its opinion, medical care and hospitalization is now being furnished to dependents of service personnel without clear-cut congressional authority. The Army, Navy, and Air Force are currently furnishing medical care for dependents of service personnel on the basis of an act passed on July 5, 1884, providing, in part, that "medical officers of the Army and contract surgeons shall, wherever practicable, attend the families of the officers and soldiers free of charge."

The wholesale extension of such care as a matter of convenience and without regard to the availability of adequate civilian personnel and facilities is necessitating the induction of increased numbers of physicians into the armed services. In addition, the expansion and new construction of military medical installations to care for such dependents is an unauthorized and unnecessary expenditure of funds.

S. 932 (similar bills: H. R. 2724 and H. R. 3160)

Introduced by Mr. Hunt of Wyoming and Mr. Hendrickson of New Jersey and referred to the Senate Committee on Armed Services.

Digest of Bills.—These bills would amend the Officer Personnel Act of 1947 (Public Law 381, 80th Congress) so as to permit the commissioning of veterinarians as first lieutenants rather than as second lieutenants.

Association Position.—The Association **actively approves** these bills. The position of the Association was motivated by a change in the educational standards adopted by schools of veterinary medicine since 1949. From 1935 to 1947 veterinarians were commissioned as first lieutenants right out of school. Because the schools of veterinary medicine required a minimum of only one year of preveterinary college training for admission in 1947, instead of the two required by dental and medical schools, the entrance grade for veterinarians entering the armed services immediately after graduation was set at second lieutenant, by the Officer Personnel Act of 1947.

Since 1949, all schools of veterinary medicine have required two years of preveterinary college training as a minimum. A recent survey reveals that in actuality over half of the students admitted have three and four years of college when admitted.

S. 1531

Introduced by Mr. Saltonstall of Massachusetts and referred to the Senate Committee on Armed Services.

Digest of Bill.—This bill would reenact the language of Public Law 779, 81st Congress, as amended, with some changes and extend the effective date of that Act until July 1, 1955. The bill would retain the four priority classifications contained in existing law, and would, in addition, make the following provisions:

1. Credit would be given for service between Sept. 16, 1940, and Sept. 2, 1945, in the armed services of any country allied with the United States during World War II.

2. Physicians with 12 or more months of service since June 25, 1950, would be excluded from liability for registration and for further service.

3. Authorization would be granted for the appointment or commissioning of medical officers in grades "commensurate with professional education, experience or ability."

4. The reserve commissions of all physicians taken into the service by operation of the law would be terminated on completion of 24 months of service.

Association Position.—The Association concurs in a one year extension of the "Doctor-Draft Law" but recommends a variety of amendments to the bill. For a complete statement in this regard see the testimony presented by the Association to the Armed Services Committee of the House of Representatives on April 24, 1953, relative to an identical bill, H. R. 4495, 83rd Congress (THE JOURNAL, May 9, 1953, page 166).

H. R. 2452

Introduced by Mr. Boggs of Louisiana and referred to the House of Representatives Committee on Armed Services.

Digest of Bill.—The bill would entitle retired enlisted personnel of the Army, Navy, Marine Corps, and Coast Guard, including members of the Fleet Reserve and Fleet Marine Reserve, to receive dispensary treatment in any Army or Navy hospital. The same personnel would be permitted to have hospital care and subsistence when accommodations are available.

Association Position.—The Association **actively opposes** this bill. This bill would merely enlarge the ever-growing number of persons eligible for federal medical care.

H. R. 2756

Introduced by Mr. Seely-Brown of Connecticut and referred to the House of Representatives Committee on Armed Services.

Digest of Bill.—The bill would authorize hospitalization and medical, surgical, and dental care for members of the Coast Guard and their dependents in hospitals and dispensaries operated by the armed forces at places outside the Continental United States and at other places where hospitals operated by the United States Public Health Service are not available. This care would be available when the Coast Guard is operating in the Treasury Department.

Association Position.—The Association **actively opposes** the bill for the same reasons as indicated under S. 33 above. The Association would qualify its opposition to this bill insofar as care for dependents outside of the United States is concerned. It is recognized that care should be provided by the armed forces to dependents overseas and where civilian medical personnel and facilities are unavailable or inadequate.

H. R. 2955

Introduced by Mr. Judd of Minnesota and referred to the House of Representatives Committee on Armed Services.

Digest of Bill.—The bill would amend the "Doctor-Draft Law" to allow credit for time spent in the armed services during World War II before as well as subsequent to Navy V-12 training or Army Specialized Training.

Association Position.—The Association **actively approves** the bill in the belief that it would remove many of the inequities created by the definitions of priority 1 and 2 classifications now contained in Public Law 779, 81st Congress, as amended. At the present time physicians with service as enlisted men prior to participation in a Navy V-12 or Army Specialized Training program are not given credit for such service. The bill would change the priority classification of physicians in priorities 1 and 2 with more than 21 months of total service to priority 4.

MEDICAL RESEARCH AND ESTABLISHMENT OF MEDICAL FOUNDATIONS

S. 156

Introduced by Mr. Langer of North Dakota and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would authorize the establishment of a National Epilepsy Institute in the United States Public Health Service. The functions of this institute, under the supervision of the Surgeon General of the United States Public Health Service, would be to conduct, promote, coordinate, and assist in research and experiments and to compile and disseminate information relating to the cause, prevention, methods of diagnosis, and treatment of epilepsy.

Association Position.—The Association **actively opposes** this bill because there are already existing agencies for such a program under the supervision of the Surgeon General of the United States Public Health Service.

S. 188 (identical bills: H. R. 583, H. R. 2253 and H. R. 2693)

Introduced by Mr. Neely of West Virginia and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bills.—The bills would authorize the President to mobilize a group of outstanding experts and to coordinate and use their services in an effort to discover means of curing and preventing cancer. An initial appropriation in the amount of $100,000,000 would be authorized by these bills for this program.

Association Position.—The Association **actively opposes** these bills, because it believes that the system proposed would be ineffective in discovering a cure for cancer. A large part of the funds and research efforts of individuals, private institutions, and government agencies is now being directed to the detection of the causes of and a cure for cancer. It does not appear, therefore, that the creation of a new governmental research agency in this field would expedite the accomplishment of the desired results.

H. R. 258

Introduced by Mr. Elliott of Alabama and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would authorize an annual appropriation of $7,500,000 for research in connection with child life. The funds appropriated would be administered federally or through grants-in-aid to universities, individuals, or public or nonprofit institutions. Research authorized would include the establishment and maintenance of fellowships and the construction, acquisition, leasing, equipping, and maintaining of facilities and necessary services.

Association Position.—The Association **actively opposes** this bill in the interest of economy and inasmuch as the Children's Bureau already has the authority to do such research work.

H. R. 2290

Introduced by Mr. Morrison of Louisiana and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would amend the Public Health Service Act to authorize the establishment of an institute for research on poliomyelitis in the United States Public Health Service. An appropriation of 5 million dollars would be authorized by the bill for this institute.

Association Position.—The Association **actively opposes** this bill because there are already existing agencies for such a program under the supervision of the Surgeon General of the United States Public Health Service.

VETERANS AND VETERANS ADMINISTRATION

S. 370 (identical bills: H. R. 28 and H. R. 261; similar to H. R. 2001)

Introduced by Mr. Murray of Montana and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bills.—The bills would authorize the construction of additional hospital facilities by the Administrator of Veterans' Affairs to provide the 16,000 beds for which authorization was dropped in the budget estimate for the fiscal year 1950. The bills would also authorize the Administrator of Veterans' Affairs, with the approval of the President, to make changes in the location, size, and type of facilities in the program heretofore approved.

Association Position.—In view of the facts contained in the report of the Special Committee on Federal Medical Services submitted in December, 1952, the Association **actively opposes** these bills.

S. 609 (identical bills: H. R. 25 and H. R. 1573)

Introduced by Mr. Sparkman of Alabama and referred to the Senate Committee on Finance.

Digest of Bills.—The bills would amend Veterans Regulation Numbered 1 (a) as amended, to establish a presumption of service-connection for chronic and tropical diseases developing to a degree of 10% or more within three years after separation from active service, notwithstanding the fact that there is no record of such disease during active service.

Association Position.—The Association feels that these bills are too general and do not define the terms "chronic" and "tropical diseases." In addition, the bills represent another effort to further liberalize existing Veterans Administration regulations regarding the presumption of service connection. The continuation of such a policy of liberalization will not only result in a distortion of the theory on which compensation benefits are based but will also result in the extension of hospitalization and medical care benefits to veterans with disabilities that are in actuality not service-connected, regardless of their ability to pay for such care from private sources. The Association therefore **actively opposes** these bills.

S. 762 (identical bill: H. R. 33)

Introduced by Mr. Martin of Pennsylvania and referred to the Senate Committee on Finance.

Digest of Bills.—The bills would amend Veterans Regulation Numbered 1 (a) to establish a rebuttable presumption of service connection for active tuberculosis, psychosis, and multiple sclerosis that develops to a 10% or more degree of disability within three years after separation from active service.

Association Position.—The Association **actively opposes** these bills for the reasons stated under S. 609 et al.

H. R. 35 (identical bill: H. R. 1543)

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bills.—The bills would amend Veterans Regulation Numbered 6 (a), as amended, to authorize the Administrator of Veterans' Affairs to supply hospital care and medical treatment to veterans who are citizens of the United States visiting or residing abroad for disabilities incurred in service.

Association Position.—The Association supports the principle of providing care for veterans with service-connected disabilities, but opposes these bills as drafted because they are too vague and may possibly authorize the construction of Veterans Administration hospitals overseas.

H. R. 45

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would establish a rebuttable presumption of a service-incurred or aggravated disability in case of malignant tumors that develop to a 10% or more degree of disability within two years after separation from active service.

Association Position.—This bill sets up an arbitrary rule that the Association feels is not medically sound. The Association **actively opposes** the bill for this reason and for those listed under S. 609 et al.

H. R. 46 (similar bills: H. R. 310 and H. R. 2097)

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bills.—The bills would amend Veterans Regulation No. 1 (a) to establish a rebuttable presumption of service-connection for wartime veterans developing tuberculosis other

than pulmonary within three years after separation from active service.

Association Position.—The Association **actively opposes** these bills for reasons indicated for H. R. 45 above and S. 609 et al.

H. R. 54

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would authorize the appointment of doctors of chiropractic in the Department of Medicine and Surgery of the Veterans Administration. To be appointed such a person must hold a degree of doctor of chiropractic from a school or college approved by the Administrator, be licensed to practice in one of the states or Territories or the District of Columbia, and have practiced chiropractic for at least two years.

Association Position.—The Association **actively opposes** this bill.

H. R. 338

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans Affairs.

Digest of Bill.—The bill would amend Veterans Regulation Numbered 7 (a) to authorize the Administrator of Veterans' Affairs, within the limits of existing facilities over which the Veterans Administration has direct and exclusive jurisdiction, to furnish outpatient medical, dental, and surgical treatment for non-service-connected disabilities to any veteran eligible for hospitalization if he is in receipt of or entitled to compensation for a 100% disability or pension for permanent and total disability. Such outpatient care is contingent upon the fact that such care is medically feasible and less costly than hospitalization by the Veterans Administration.

Association Position.—The Association **actively opposes** this bill, in view of the facts contained in the report of the Special Committee on Federal Medical Services submitted in December, 1952. The provision of outpatient care for individuals with non-service-connected disabilities would greatly extend the responsibility of the government for this type of disability.

H. R. 1414

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would authorize the Administrator of Veterans' Affairs and the secretaries of the Army, Navy and Air Force, with the approval of the President and the Secretary of Defense, to transfer hospitals, facilities, equipment, etc., between the Veterans Administration and the Armed Services.

Association Position.—The Association **approves** this bill. It is felt that in providing federal medical and hospital services there should be an allocation of beds and hospitals in an effort to attain the greatest economy. It is not now possible for the Department of Defense to take over Veterans Administration hospitals without a transfer of funds.

H. R. 2573

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would amend Public Law 62, 76th Congress, as amended, to provide that veterans of the Spanish-American War, including the Boxer Rebellion and the Philippine Insurrection, who are in need of outpatient treatment, shall for the purposes of such treatment or for emergency hospital care, be deemed to have a service-connected disease or disability.

Association Position.—The Association **actively opposes** this bill because it is not medically sound and would distort completely the theory on which compensation and service-connected medical care and hospitalization benefits are based. It is believed that if such a precedent were established, eventually benefits of this type would be extended to other veterans, which would make a large part of the population eligible for such medical care.

H. R. 2980

Introduced by Mrs. Rogers of Massachusetts and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would authorize and direct the Chief Medical Director of the Veterans Administration to make available to all veterans entitled to outpatient eye care the services of qualified optometrists.

Association Position.—The Association **opposes** the bill because: (1) it would compel the Chief Medical Director of the Veterans Administration to make available a particular type of service even though in his professional judgment it was not suitable in a particular case; (2) there can be no reliable evidence presented that veterans now are denied any eye care that the enactment of this bill would make available; (3) the training that an optometrist receives does not qualify him to give the veteran suffering from a visual disturbance "proper eye care," and the optometrist is not authorized by law to use medication or to employ surgery; and (4) the services of optometrists are now made available to veterans on request in certain cases in which an examination by a qualified ophthalmologist fails to disclose the existence of a cause of visual abnormality unrelated to lens power.

H. R. 3070

Introduced by Mr. Frelinghuysen of New Jersey and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bill.—The bill would amend Veterans Regulation No. 1 (a) to establish a presumption of service-connection for war-time veterans in whom amyotrophic lateral sclerosis develops to a degree of 10% or more within two years after separation from active service.

Association Position.—The Association **actively opposes** this bill for the reasons outlined under S. 609 et al.

FEDERAL AID TO EDUCATION

S. 461

Introduced by Mr. Humphrey of Minnesota and referred to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The bill would amend the Public Health Service Act to provide grants-in-aid and federal scholarships for postgraduate education in the field of public health. The bill would authorize annual appropriations to enable the Surgeon General of the United States Public Health Service to meet the "basic operating costs of graduate instruction" in schools of public health, for grants for the construction and equipping of new schools of public health, and for the expansion of existing facilities. In addition, sums would be authorized annually for five years for scholarships in public health training (including hospital administration).

Association Position.—The Association **actively opposes** this bill for the same reasons as for S. 337, 82nd Congress (federal aid to medical education). It is the belief of the Association that under such a system an objectionable degree of federal control would be inevitable. The bill would create an opportunity for the exercise of political pressure and intervention and would jeopardize the academic freedom of medical schools.

H. R. 250

Introduced by Mr. Elliott of Alabama and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would authorize federal grants to states on a 50-50 matching basis to help finance health and safety instruction and physical education for children of school age. States must have approved plans that provide (1) for a program to improve health and safety instruction and physical education in local schools; (2) that the state treasurer be the custodian of the funds; (3) for an equitable apportionment of funds for different racial groups; (4) for administration and supervision of plans by the state administrative agency; and (5) for periodic reports.

Association Position.—The Association **actively opposes** this bill because it (1) deals with a state and local problem and (2) provides for an unnecessary expenditure of funds.

H. R. 2718

Introduced by Mr. Heller of New York and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would authorize the creation of a United States Medical and Dental Academy for the purpose of training physicians and dentists for the Armed Services and the United States Public Health Service.

Association Position.—The Association **actively opposes** this bill since faculties would be difficult to obtain, hospital service would be hard to execute in connection with the school, and the manner of selection of the entrants would probably be political.

H. R. 2838

Introduced by Mr. Elliott of Alabama and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would authorize the appropriation of 32 million dollars for the fiscal year 1954 to establish a program of federal aid to students in higher education. The bill provides for a gradual increase in authorized appropriation until 1957, when the cost would be 128 million dollars. States would administer the program under federal regulation promulgated by the Office of Education of the Federal Security Administration. Four year college scholarships would be allowed, with loans to students not to exceed $800 per year. Medical education would be included, although it is not specifically referred to in the bill.

Association Position.—The Association **actively opposes** this bill for the reasons outlined under S. 461.

TAX RELIEF

H. R. 474

Introduced by Mr. Keating of New York and referred to the House of Representatives Committee on Ways and Means.

Digest of Bill.—This bill would, in part, amend section 23 (x) of the Internal Revenue Code (relating to deductions from gross income) and provide for a graduated scale of medical care deductions based on adjusted gross income. It would include in the term "medical care" amounts not compensated for by insurance or otherwise that are paid for "the diagnosis, cure, mitigation, treatment or prevention of disease or for the purpose of affecting any structure or function of the body (including amounts paid for accident and health insurance)."

Association Position.—The Association **actively approves** this bill in principle since it would afford individual relief in cases of extremely high medical expenses and would also be an incentive to buy voluntary health insurance.

H. R. 482

Introduced by Mr. Keating of New York and referred to the House of Representatives Committee on Ways and Means.

Digest of Bill.—This bill would amend part III of chapter I of the Internal Revenue Code as amended and insert a new section 36 to provide for the deduction of sums paid as premiums or subscription charges for health or medical insurance or plans from federal income tax, irrespective of whether such plans or programs are operated, financed, or administered by or through either public or private organizations or individuals.

Association Position.—The Association **approves** the bill in principle.

H. R. 2243

Introduced by Mr. Dague of Pennsylvania and referred to the House of Representatives Committee on Ways and Means.

Digest of Bill.—The bill would authorize the deduction of medical and dental expenses from gross income for income tax purposes. The term "medical expenses" is defined by the bill to include "amounts paid for the diagnosis, cure, mitigation, treatment or prevention of disease, or for the purpose of affecting any structure or function of the body (including amounts paid for accident or health insurance)." Such medical expenses incurred by the taxpayer, his spouse or his dependents would be deductible.

Association Position.—The Association **actively approves** the bill in principle since it would afford individual relief in cases of extremely high medical expenses and would also be an incentive to buy voluntary health insurance. Under present law medical expenses are deductible only after the adjusted gross income has been determined and such expenses exceed a minimum amount (5% of adjusted gross income) and are not in excess of a fixed maximum ($2,500 on an individual return or $5,000 for a husband and wife jointly).

SOCIAL SECURITY AND DISABILITY INSURANCE

H. R. 383 (similar bills: H. R. 2070 and H. R. 2150)

Introduced by Mr. Byrd of West Virginia and referred to the House of Representatives Committee on Ways and Means.

Digest of Bills.—The bills would amend Title II of the Social Security Act to provide cash disability insurance benefits for totally disabled individuals. These monthly benefits would be payable after a six month waiting period to those persons "unable to engage in any substantially gainful activity by reason of any medically demonstrable physical or mental impairment, or blindness." Medical examinations to determine eligibility for disability benefits would be performed by federal employees or private physicians in accordance with regulations promulgated by the administrator. The cost of such examinations and necessary travel expenses would be paid from the Social Security Trust Fund. Periodic reexaminations would be similarly conducted and financed. Failure to submit to such examination or to accept rehabilitative services would be sufficient grounds for suspension of benefits.

Association Position.—The Association **actively opposes** the bills, thus reiterating the past opposition of the Association to amendments to the Social Security Act providing for permanent and total disability and cash sickness benefits and a broad rehabilitative program for Social Security beneficiaries. It is the belief of the Association that the initiation of a federal disability benefit program would represent a major step toward the wholesale nationalization of medical care and the socialization of the practice of medicine. The provisions in these bills regarding disability certification would establish an inferior type of physician-patient relationship, which, along with the entire program, would undoubtedly result in a deterioration of medical care.

H. R. 1376

Introduced by Mr. Bryson of South Carolina and referred to the House of Representatives Committee on Ways and Means.

Digest of Bill.—The bill would amend Title II of the Social Security Act by reducing the age requirement for Old-Age and Survivors Insurance benefits from 65 to 62 and, in addition, would authorize the payment of such benefits to an individual when "his permanent physical or mental condition became such that he was unable to engage in any regular employment." The bill does not spell out the criteria to be applied in making such determinations or how the provisions shall be administered.

Association Position.—The Association **actively opposes** the bill for the reasons specified in connection with H. R. 383.

H. R. 2000

Introduced by Mr. Rhodes of Pennsylvania and referred to the House of Representatives Committee on Ways and Means.

Digest of Bill.—The bill would amend Title II of the Social Security Act to provide cash disability insurance benefits for permanently and totally disabled individuals. These monthly benefits would be payable after a six month waiting period to persons unable "to engage in any substantially gainful activity by reason of any medically determinable physical or mental impairment which can be expected to be permanent, or blindness." The bill does not spell out the criteria to be applied in making such determination or how the provisions shall be administered.

Association Position.—The Association **actively opposes** the bill for the reasons outlined in connection with H. R. 383.

H. R. 2446 (identical bills: H. R. 2447 and H. R. 3105)

Introduced by Mr. Angell of Oregon and referred to the House of Representatives Committee on Ways and Means.

Digest of Bills.—The bills would repeal Titles I and II of the present Social Security Act and would create a new Social Security System on a pay-as-you-go basis. The following persons would be eligible for a monthly annuity of an undisclosed amount: (*a*) citizens 60 years of age or over; (*b*) citizens who are "disabled" for a period longer than six months; and (*c*) widows who are citizens and have the care of one or more children under 18 years of age. The annuity to be paid would, by the terms of the bills, necessarily be spent in the United States, its territories, or possessions within 30 days after receipt. The annuitant could not engage in any occupation for which a wage, profit, or other compensation is received and still be paid a monthly benefit. The program would be financed by a fixed 2% tax to be collected monthly on the gross income of all persons or companies derived from any source. In connection with personal income there would be an exemption of $250 per month. Certain fraternal, religious, and other eleemosynary organizations would be excluded from the provisions of the act. The taxes thus collected would be placed in a "Business Employment and Security Insurance Account" from which the monthly benefits would be paid.

Association Position.—The Association **actively opposes** these bills because they would authorize permanent and total disability benefits, to which the Association has repeatedly voiced its opposition. The Association also feels that such legislation should be held in abeyance pending a report from the commission that has been proposed to study governmental functions and fiscal resources (see S. 1514). The Bureau of Medical Economic Research of the American Medical Association is in the process of preparing a report on the general subject of pay-as-you-go Social Security plans.

COMPULSORY HEALTH "INSURANCE" AND FEDERAL SUBSIDIZATION OF PRIVATE PLANS

H. R. 1590

Introduced by Mr. Miller of California and referred to the House of Representatives Committee on Post Office and Civil Service.

Digest of Bill.—The bill would authorize, on the request of the employee and under regulations to be promulgated by the Civil Service Commission, the withholding of premium payments for life, health, accident, medical, and hospitalization insurance from the compensation due to federal employees.

Association Position.—The Association **opposes** the bill, pending further information from the Council on Medical Service and the Bureau of Medical Economic Research.

H. R. 1817

Introduced by Mr. Dingell of Michigan and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—This is an omnibus bill (163 pages) that would provide for a variety of legislative changes in the role of the federal government in medicine. Briefly, the bill would provide (*a*) federal aid to medical, dental, etc., education; (*b*) federal subsidization of practical nurse training; (*c*) increased federal subsidization of medical research; (*d*) authorize an extensive survey of hospital facilities and extend federal assistance in hospital construction; (*e*) federal assistance in supplying physicians and medical facilities to rural areas; (*f*) federal aid to local public health units; (*g*) federal research in child and maternal health; and (*h*) establishment of a federal national health "insurance" program.

Association Position.—The Association **actively opposes** the bill.

AID TO THE HANDICAPPED

H. R. 402

Introduced by Mr. Celler of New York and referred to the House of Representatives Committee on Education and Labor.

Digest of Bill.—The bill would amend various existing laws dealing with federal aid to the blind and other seriously disabled persons. The purpose of the act is to authorize a comprehensive grant-in-aid program to assist the states in furnishing a variety of services to the blind and others seriously disabled.

Association Position.—The Association **actively opposes** the bill pending the report of the Commission on Federal-State Relationships.

H. R. 2096 (identical bills: H. R. 2147, H. R. 2149, H. R. 2300, H. R. 2342, H. R. 2346, H. R. 2519, H. R. 3177, H. R. 3188, H. R. 3291)

Introduced by Mr. Hagen of Minnesota and referred to the House of Representatives Committee on Education and Labor.

Digest of Bills.—The bills propose to establish an independent federal agency to be known as the Federal Agency for Handicapped, to provide various types of rehabilitative services to persons physically or mentally handicapped. The agency would absorb the functions of the Office of Vocational Rehabilitation, the Division of the Physically Handicapped in the Bureau of Labor Statistics, the functions of the Library of Congress in furnishing aid for the blind, and the functions of the Federal Security Agency with respect to the Vocational Rehabilitation Act and state grants for aid to the blind. The new agency also would coordinate all other rehabilitative measures for the benefit of handicapped persons, administered by other agencies of the government.

Association Position.—The Association **opposes** these bills pending the report of the Commission on Federal-State Relationships.

MISCELLANEOUS

S. 601 (identical bills: S. 835 and H. R. 2769)

Introduced by Mr. Humphrey of Minnesota to the Senate Committee on Labor and Public Welfare.

Digest of Bills.—The bills would amend section 704 of the Federal Food, Drug, and Cosmetic Act by restoring authority in the Food and Drug Administration to inspect factories without first making a request and obtaining permission. Written advance notice would suffice.

Association Position.—The Association **approves** the principle of the bills, provided that proper safeguards are included to protect the physician-pharmacist-patient relationship. It believes that the inspection privilege should not be extended to confidential business and professional records that have no specific bearing on the enforcement of the Food, Drug, and Cosmetic Act.

S. 967 (identical bill: H. R. 3171)

Introduced by Mr. Taft of Ohio and Mr. Hill of Alabama to the Senate Committee on Labor and Public Welfare.

Digest of Bills.—The bills would amend Title VI of the Public Health Service Act as amended, to extend to June 30, 1957, the annual appropriation of 75 million dollars to assist the states in the construction of public and other nonprofit hospitals.

Association Position.—The Association **approves** these bills.

S. 994

Introduced by Mr. Saltonstall of Massachusetts and six others to the Senate Committee on Labor and Public Welfare.

Digest of Bill.—The purpose of the bill is to develop and extend basic state and local public health organizations through federal subsidization. The bill would authorize state grants to develop and maintain public health services, including the establishment of new local public health units and the training of personnel for state and local public health work and to

provide measures for the prevention, treatment, and control of disease. The section would also authorize the Surgeon General of the United States Public Health Service to provide demonstrations and to train personnel for state and local public health work.

Association Position.—The Association **opposes** the bill, pending the report of the Commission on Federal-State Relationships.

S. 1514

Introduced by Mr. Taft of Ohio and referred to the Senate Committee on Government Operations.

Digest of Bill.—The bill would establish a Commission on Governmental Functions and Fiscal Resources. Of the 25 commission members, 15 would be appointed by the President; 5 by the President of the Senate, 3 from the majority party and 2 from the minority party; and 5 by the Speaker of the House of Representatives, 3 from the majority and 2 from the minority. The commission would study and investigate all the activities in which federal aid is extended to state and local governments. The objective would be to determine whether there is justification for such federal aid, whether there are other fields in which the federal government should participate, whether federal control should be limited, and whether federal aid should be limited in cases of need, and the ability of the federal government and the states to finance such activities. The commission would submit its final report, including legislative recommendations, not later than March 1, 1954, and could make interim reports.

Association Position.—The Association **actively approves** S. 1514, as well as an identical bill introduced in the House of Representatives, H. R. 4406, 83rd Congress. It is the belief of the Association that such a survey is imperative to determine whether there is justification for federal aid in the various fields in which such assistance has been extended during the past few years, whether such activities should be limited and if so to what extent, and, finally, to permit an over-all appraisal of the ability of the federal government to finance activities of this nature.

H. R. 116

Introduced by Mrs. Church of Illinois and referred to the House of Representatives Committee on the Judiciary.

Digest of Bill.—The bill would amend Title 18, U. S. C., Chapter 39, so as to prohibit the interstate transportation of fireworks into any state in which the sale of such fireworks is prohibited, unless they are to be used for public displays or other purposes specifically authorized by the laws of such state.

Association Position.—Because of the serious injuries that result from the indiscriminate use of fireworks, the Association **approves** the principle of the bill and has submitted a statement to the Committee on the Judiciary of the House of Representatives in this regard.

H. R. 633 (identical bill: H. R. 2862)

Introduced by Mr. Teague of Texas and referred to the House of Representatives Committee on Veterans' Affairs.

Digest of Bills.—The bills would establish a federal Board of Hospitalization to be composed of the Attorney General of the United States, the secretaries of Defense and the Interior, the administrators of Veterans' Affairs, the Federal Security Agency, and the General Services Administration, and the Director of the Bureau of the Budget. The Administrator of Veterans' Affairs would act as chairman of the board.

The Board would attempt to coordinate the construction and utilization of hospital facilities by the federal government to prevent overlapping and duplication of services and overbuilding of facilities.

Association Position.—The Association **approves** the principle of the establishment of a federal Board of Hospitalization but disapproves the present bills. The Association recommends that any board that is established be composed of the Secretary of the Interior, the Director of the Budget, and a representative of the Department of Defense, and that the number of civilian members be at least equal to the number of government representatives. Government officials in charge of medical programs should serve in an advisory capacity only.

H. R. 2449

Introduced by Mr. Bailey of West Virginia and referred to the House of Representatives Committee on Interstate and Foreign Commerce.

Digest of Bill.—The bill would establish an independent agency to be known as the Bureau of Clinics for the treatment of chronic alcoholics and narcotic addicts. The bureau would also assist states and private agencies to establish "farms" and to train and educate personnel in approved methods of treatment, cure, and rehabilitation of drug addicts and alcoholics. The facilities of the United States Employment Service would be used in finding suitable employment for those rehabilitated. The powers, duties, responsibilities, and functions vested in the Surgeon General of the United States Public Health Service would be transferred to the new Bureau.

Association Position.—The Association **opposes** the bill because it feels that if such a program is to be developed, it should be under the direction of the United States Public Health Service. Also, the Association does not look with favor at this time on the establishment of new bureaus in the government.

FEDERAL MEDICAL LEGISLATION

Vocational Rehabilitation for Mental Patients

Senator Humphrey (D., Minn.), has introduced S. 2145, which would amend the Vocational Rehabilitation Act by redefining "vocational rehabilitation" and "rehabilitation services" so as to include mental conditions, and also would extend the definition of "hospital" as used in the Hospital Construction Act to include hospitals furnishing primarily domiciliary care. The bill would authorize the use of federal grants to states for corrective surgery or treatment of mental as well as other disabling conditions. The measure was referred to the Labor and Public Welfare Committee.

Post High School Scholarship Loans

Senator Langer (R., N. D.), introduced a bill to authorize appropriation of 50 million dollars to be administered by the U. S. Commissioner of Education as a revolving fund for direct loans to students for vocational, technical, academic, or professional education beyond high school. Loans could be used for tuition, books, supplies, board, lodging, or other necessary educational expenses, but could not exceed a total of $1,000 to an individual person. Students would be required to give a note bearing interest at 1% and maturing in 15 years. Schools would be required to furnish a certificate that the applicant is qualified for the proposed course of study. The bill was referred to the Labor and Public Welfare Committee.

Reorganization of the Department of Defense

H. R. 295 and a bill H. R. 5845, both introduced by Condon (D., Calif.), would have disapproved or modified the Presidential Reorganization Plan No. 6 because of two provisions designed to strengthen the authority of the chairman of the joint chiefs of staff. The resolution lost by 2 to 1 on the floor and the presidential plan became effective June 30. Medical interest is centered on an assistant secretary who will be responsible for health and medical matters. The bills were referred to the Government Operations Committee.

Silicosis Investigation

Congressman Metcalf (D., Mont.), has introduced a resolution H. R. 286 which would authorize the House Committee on Education and Labor to investigate prevention and control of occupational diseases in the mining industry. The resolution was referred to the Rules Committee.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

Bricker Resolution

Chairman Reed (R., Ill.), of the Judiciary Committee has introduced H. J. R. 280 which is identical with S. J. R. 1, as amended and reported by the Senate Committee on the Judiciary. The new language was suggested by the American Bar Association and substituted for the original language of the Bricker Resolution. The measure was referred to the Judiciary Committee.

STATE MEDICAL LEGISLATION

Alabama

Bill Introduced.—S. 232, proposes to authorize and regulate the **fluoridation of water supplies** and to exempt municipalities from liability for losses or injuries resulting from the addition of fluoride to the water supply when done in conformity with this proposal.

California

Bills Enacted.—S. J. R. 33, has become ch. 140 of the laws of 1953. It memorializes the Congress of the United States to **increase the staff of federal narcotic enforcement agents** and the number of border inspections and recommends that the United States confer authority upon state and local narcotic enforcement officers in border cities and counties to conduct searches and make inspections at border areas. S. J. R. 34, has become res. ch. 141 of the laws of 1953. It memorializes the Congress of the United States to amend the narcotic drugs import and export act so as to **increase the penalties of second and subsequent narcotic offenders.** S. R. 112, was adopted June 10, 1953. It provides for the creation of an interim commission on the **licensing of business and professions** and directs such commission to ascertain study and analyze all facts relating to the licensing of business and professions in California. S. 1770, has become ch. 1098, of the laws of 1953. It **prohibits the operation, establishment, and conduct of a clinic unless a license has first been obtained** from the state department of public health. A clinic is defined as a place, establishment or institution which operates under the name or title of clinic, dispensary, health center, medical center, or any other word or phrase of like or similar import either independently or in connection with any other purpose for the purposes of furnishing at the place, establishment, or institution advice, diagnosis, treatment, appliances, or apparatus to persons not residing or confined in the place, establishment or institution who are afflicted with bodily or mental disease or injury.

Connecticut

Bills Enacted.—H. JR. 87, was adopted May 22, 1953. It directs the legislative council to make a study of the care and treatment of **hibitual alcoholics afflicted with tuberculosis** and to report back to the 1955 legislature. S. 897, has become public act No. 389, of the acts of 1953. It provides for the **licensing, inspection and regulation of certain institutions** among which are medical facilities operated by the commission on the care and treatment of the chronically ill, aged, and infirm.

Delaware

Bills Enacted.—H. 307, was approved June 18, 1953. It provides an appropriation to the state board of health to be used for the purpose of carrying out of a **state-wide chest x-ray survey.** H. 356, was approved June 22, 1953. It authorizes the medical council to issue **temporary emergency certificates,** said temporary emergency certificates to be limited to 12 months' duration renewable at the discretion of the issuing authority, to such physicians licensed in a state of the United States other than Delaware as shall be found qualified to practice as such in this state during a serious public emergency. The holder of such temporary certificates shall be privileged during the terms specified therein to practice his profession within the state subject to laws generally applicable to the practice of the profession and to regulations and restrictions imposed by the medical council.

Florida

Bills Enacted.—H. 536, was approved June 12, 1953. It amends the law relating to **osteopathy** by increasing the educational requirements of applicants and by adding a list of subjects in which applicants must be examined. H. 1109, became law without approval June 15, 1953. It provides regulations relating to **agreements for the maintenance of personal care** for a period of one or more years or for life or for a fixed fee. The term personal care is defined as including the furnishing of medicine and medical attention. H. 1367, was approved June 12, 1953. It fixes the salary of **county medical examiners** and assistant county medical examiners and authorizes the employment by the county medical examiner of pathologists, toxicologists, chemists, and other specialists and technicians when necessary. H. 1754, became law without approval June 15, 1953. It provides for the **creation of liens in favor of hospitals** maintained in counties having a population of not less than 60,000 people. The lien would be in the amount of the value of care rendered to an injured person and would be upon any claim which such injured person might have against another for damages causing the injuries neeessitating the hospital care. H. 1755, was approved June 12, 1953. It provides a **lien in favor of hospitals** operated in Volusia County. The lien would be in the amount of the value of hospital care rendered to a person and would be upon any claim which such person might have against another for damages for the injuries making the rendition of hospital care necessary. H. 1856, became law without approval June 15, 1953. It creates a **Halifax Osteopathic Hospital District** with authority to raise funds for the establishment and creation of an osteopathic hospital. S. 14, became law without approval June 15, 1953. It amends the **narcotic act** by adding to the list of narcotic drugs any drugs to which the narcotic laws of the United States apply and any drugs which have been determined by the state board of health as having addiction-forming or addiction-sustaining qualities similar to cocaine, opium, isonipecaine, and cannabis. The new law also adds penalties for violations of the act in connection with minors and provides that for a third or subsequence offense the offender may be punished by imprisonment up to 20 years and may not receive a suspended sentence or probation. S. 597, became law without approval June 15, 1953. It revises and reenacts the **Florida Pharmacy Act.** S. 783, was approved June 11, 1953. It provides for the creation of a **Florida rehabilitation center for alcoholics,** the duty of which shall be to formulate and effect a plan for the prevention, care, treatment, and rehabilitation of alcoholics. S. 916, became law without approval June 15, 1953. It authorizes boards of county commissioners and boards of public instruction in certain counties in the state to provide **for life, health, accident, hospitalization, or annuity insurance for employees** and their families upon a group insurance plan.

Hawaii

Bills Enacted.—H. 325, was approved June 16, 1953. It provides that **no person shall** at any time have or **possess a hypodermic syringe or needle** or any instrument or implement adapted to the use of habit-forming drugs by injection, which is possessed for his personal use in administering habit-forming drugs, unless such possession be authorized by the certificate of a physician and issued within a period of one year prior to such possession. S. 567, was approved June 16, 1953. It makes it the duty of every physician and surgeon attending or treating a case of **knife wound, bullet wound, gunshot wound, powder burn** or any injury that would seriously maim, produce death, or has rendered the injured person unconscious, caused by the use of violence or sustained in a suspicious or unusual manner to report such case to the chief of police. When such case is treated in a hospital or clinic, the superintendent shall also report it.

Illinois

Bills Enacted.—H. 698, was approved June 16, 1953. It requires all **drug addicts to register** with the department of registration and education and to obtain a card which he shall carry with him at all times. The law, however, does not apply to persons who repeatedly use narcotic drugs when the same are prescribed, administered, or dispensed by a licensed physician or licensed dentist or are administered or dispensed by a nurse or intern under the direction or supervision of such physician or dentist. H. 823, was approved June 16, 1953. It creates a **Krebiozen Investigating Commission** to make a thorough investigation for the purpose of ascertaining the facts of the controversy that has arisen at the University of Illinois concerning research on krebiozen and to report back to the 1955 legislature.

Massachusetts

Bill Introduced.—S. 756, proposes the creation of a special committee to make a study of the **workmen's compensation law.**

Michigan

Bill Enacted.—H. 342, has become pub. act no. 95 of the acts of 1953. This was erroneously designated H. 1342 in THE JOURNAL (**152**:826 [June 27] 1953). It provides that no **autopsies, postmortems, and dissections** shall be performed upon the body of a deceased person except by a licensed physician who has been granted written consent therefor by whichever one of the following assumes custody of the body for the purpose of burial: father, mother, widow, widower, guardian, next-of-kin or person charged by law with the responsibility of burial.

Oklahoma

Bills Enacted.—H. J. R. 530, was approved May 16, 1953. It provides for the appointment of a joint committee for the purpose of studying the problem raised by the present **institutional care and housing of the aged and senile** both within and without the mental institutions of Oklahoma. H. 1099, was approved May 25, 1953. It amends the law relating to the **practice of chiropractic** by providing eight new grounds for revocation or suspension of a license. S. 60, was approved June 8, 1953. It authorizes the state commissioner of health to designate by list or general define those **diseases or illnesses which should be reported** and to request all physicians of the state to cooperate in the reporting of such diseases. S. 153, was approved June 8, 1953. It authorizes the state board of health to approve the use of **antiseptic, other than nitrate of silver,** for use in the eyes of new-born children and to prescribe the manner of their use. S. 158, was approved June 12, 1953. It provides an appropriation for the University of Oklahoma School of Medicine for the purpose of conducting research on **heart disease and cancer control.** S. 246, was approved May 18, 1953. It provides for the **licensing of physical therapists** by the state board of medical examiners and defines physical therapy as any professional service requiring special education, knowledge or skill in the treatment of any bodily conditions of any person by the use of physical, chemical, and other properties of heat, light, water, electricity, massage, and therapeutic exercise, which includes posture and rehabilitation procedures. Diagnosis for therapeutic purposes, the use of roentgen rays for diagnostic and therapeutic purposes, radium for therapeutic purposes, the practice of orthoptic, the use of electricity for surgical purposes including cauterization, and major and minor surgery are not authorized under the term physical therapy.

COMMITTEE ON MENTAL HEALTH

Mental Health Activities of State Medical Associations

In January of this year, Dr. George Lull, Secretary of the Association wrote to each of the secretaries of the state and territorial medical associations advising them that the newly formed Committee on Mental Health of the A. M. A. had had several meetings, and that one of the matters discussed had been the possibility of establishing a strong liaison between this new committee and committees on mental health or mental hygiene of state medical associations for the purpose of exchanging plans and information.

To date, some 26 replies have been received from secretaries of state associations or from chairmen of committees on mental health of these associations. These letters indicate that 24 of the 26 associations have already established committees on mental health or mental hygiene and have active programs underway. In many instances, replies indicated not only that committees had been formed but also described the types of work that had already been undertaken.

The Committee on Mental Health has reviewed the replies, and has prepared the material in summary form for distribution to state and territorial associations. Inasmuch as the replies from the state associations indicated that the programs that are now underway vary widely from a broad range of activities to participation in only a few activities, we thought it of value to list some of the activities in which state association committees on mental health might take an active interest. Many of these activities have already been sponsored in some of the states.

1. Study of Blue Cross-Blue Shield and other medical service plans to determine ways by which these plans may more effectively provide for treatment of mental and emotional illness (Bennett, A. E.; Hargrove, E. A., and Engle, B.: Voluntary Health Insurance and Nervous and Mental Disease, J. A. M. A. 151:202 [Jan. 17] 1953).

2. Establishment of citizen groups for promotion of mental health education services (women's auxiliaries).

3. Recommendations to legislatures for increased budgets for mental institutions. (Present average is about at a $2 per patient per day level for patient maintenance. It has been demonstrated that this low budgetary level is responsible in great part for the present nation-wide difficulty in properly caring for patients in mental institutions. [The Mental Health Programs of the Forty-Eight States, Council of State Governments, Chicago, 1950].) The Committee on Mental Health of the American Medical Association and the American Psychiatric Association are both in agreement that budgetary levels need to be materially increased. Under present conditions, they should approximate a level of $5 per patient per day.

4. Serving as a central office for dissemination of information on programs for mental health to the medical profession and public.

5. Efforts toward the establishment of psychiatric departments or services in general hospitals and increasing other psychiatric services in the community.

6. Recommendations to legislative committees of state medical associations that changes or amendments be made in medical practice acts to include "mental illness" and "psychotherapy" as being within the legal definition and responsibility of the practice of medicine.

7. Improvement of facilities and level of professional care in state institutions for care of mentally ill. (See Standards for Psychiatric Hospitals and Clinics, Prepared by the Committee on Psychiatric Hospital Standards and Policies, American Psychiatric Association, 1951.)

8. Establishment of facilities for psychiatric consultation to courts and penal institutions.

9. Review of, and sponsorship of, legislation for state mental health activities relating to problems of alcoholism and addiction.

10. Sponsorship of improved state laws for commitment to mental institutions and provision for and encouragement of voluntary admissions to mental institutions. (References to improve statutes are carried in The Mental Health Program of the Forty-Eight States, Council of State Governments, Chicago, 1950.)

11. Sponsorship of programs for postgraduate education of physicians in the utilization of psychiatric principles in the practice of medicine.

12. Sponsorship of programs in psychiatry and mental health in county society meetings during Mental Health Week in May of each year.

13. Encourage the setting up of collaborating Committees on Mental Health in all county societies.

As one of the activities of the A. M. A. Committee on Mental Health for 1953, we are undertaking jointly with the American Psychiatric Association a meeting of executives of 50 or more organizations on a national level who now participate in work in the mental health field. At this meeting, we will review what is now being done by the many interested groups, and hope we will be able to establish a set of plans and objectives for our own committee that will best define our own proper spheres of activity. We particularly wish to avoid duplicating effective work that is now being accomplished by other national groups.

It has been suggested that following this meeting that a second meeting be sponsored by this committee to include mental health representatives of the state associations and county societies, with a view toward establishing coordinated planning for mental health activities by organized medicine as represented by the Association and affiliated state and county societies.

Leo H. Bartemeier, M.D.
Chairman
Committee on Mental Health

PROCEEDINGS OF NEW YORK MEETING

Resolutions on Advertising of Medical Products

Resolutions on Advertising of Medical Products were introduced in the House of Delegates at the New York Meeting by Dr. Wendell C. Stover, Indiana (see THE JOURNAL for June 27, 1953, page 844) and were referred to the Reference Committee on Miscellaneous Business.

The report of the reference committee on these resolutions, which was adopted by the House of Delegates, was inadvertently omitted from the published proceedings. It reads as follows:

With regard to the Indiana resolution concerning advertising of medical products, your committee has considered this most important matter and has listened to a great deal of very pertinent discussion by individual physicians, the Editor of THE JOURNAL and the Secretary of the Committee on Research of the Council on Pharmacy and Chemistry. We have concluded that this is a problem that cannot be solved by action of the House. The solution must depend on action of the Board of Trustees. Your committee therefore recommends that this matter be referred to the Board of Trustees, with the urgent request that it set up mechanisms that will in the future prevent the situation whereby advertisements in any or all American Medical Association publications are at variance with the scientific and editorial content of these publications. It also recommends that the same policy be followed by all other medical journals.

MEDICAL NEWS

CALIFORNIA

Society News.—At its annual meeting, the California Society of Allergy elected Dr. Grace M. Talbott, San Francisco, president, Dr. Norman M. Shure, Los Angeles, president-elect, and Dr. Lazarre J. Courtright, San Francisco, secretary-treasurer.

Hospital Establishes Scholarship Plan.—In a plan initiated by Dr. Charles L. Lowman, director of education and rehabilitation, the Orthopaedic Hospital in Los Angeles has established tuition-loan scholarships at the University of Southern California, Los Angeles, for students interested in becoming physical or occupational therapists. The plan provides for three tuition scholarships a year ($772 each, per school year) over a period of five years, when, it is anticipated, the loan fund will be self sustaining. Recipients will be asked to repay the loans, probably at a 6% interest rate, following graduation, with repayment based on the following plan: 20% the first year, 30% the second, 40% the third, and 10% the fourth year. Graduates employed by the Orthopaedic Hospital will not be charged interest over the period of employment. Students interested in the loans apply directly to the University of Southern California, which handles the Charles LeRoy Lowman Fund.

COLORADO

Warning—Magazine Salesman.—The Denver Area Better Business Bureau reports that Lauren Graff, a magazine salesman, recently victimized Denver physicians and dentists by taking magazine subscriptions for which he collected the money in advance and then failed to turn in the subscriptions. In Denver, he gave a fictitious address. He is described as a slight young man in his early 20's. He has a sallow complexion and light brown hair, is about 5 ft. 3 in. tall, and weighs 110 lb. He has a crippled right hand and walks with a limp. He represents himself as a salesman for the Keystone Readers Service of Los Angeles but is no longer in their employ.

CONNECTICUT

University News.—Joseph K. Hill, Ph.D., lecturer in education and public health at Yale University School of Medicine, New Haven, has been appointed assistant professor of public health and preventive medicine at the State University of New York College of Medicine at Syracuse.

Appoint Surgeon General of National Guard.—Lieut. Col. Joseph E. Sokal, New Haven, commanding officer of the 118th Medical Battalion, 43rd Infantry Division, Connecticut National Guard, has been appointed Surgeon General of Connecticut. He succeeds Brig. Gen. William B. Smith of Wethersfield, who retired last month upon reaching the statutory age limit. On active duty with the U. S. Army Medical Corps from 1942 to 1946, Dr. Sokal spent three years in the Pacific theater, most of that time with the "Fighting 69th" Regiment of the 27th Infantry Division. Veteran of two beachheads, Makin and Saipan Islands, he also served with occupation forces in Japan as a regimental surgeon in the Eleventh Airborne Division.

ILLINOIS

Rabies Quarantine.—A portion of Downers Grove township, Du Page County, was recently placed under rabies quarantine after five children were bitten by a rabid fox terrier. Hinsdale has also been placed under antirabies quarantine for three months. During this time the dogs in Hinsdale must be kept on their own property as a precautionary measure. Vaccination of all dogs is required by Hinsdale ordinance before a license can be issued. Fines of $25 to $100 are provided for quarantine violations.

Personal.—Dr. Samuel P. Durr, Rock Island, has resigned as city physician after five years in that office. Dr. David A. Goldsmith, who was formerly affiliated with Wesley Memorial Hospital and Cook County Hospital in Chicago and with Veterans Administration hospitals in Hines, Ill., and in Iron Mountain, Mich., has been appointed Dr. Durr's successor. During World War II Dr. Goldsmith served as a lieutenant in the Navy Medical Corps.——During the 50th anniversary commencement program at James Millikin University, Decatur, Dr. R. Zink Sanders of that city was named alumnus of the year.

Chicago

Portal House Moves.—Portal House of the Chicago Committee on Alcoholism has moved to new quarters at 743 N. Wabash Ave., Chicago 11. The telephone number is MOhawk 4-5536.

Rheumatic Fever Institute in October.—The board of trustees of La Rabida Sanitarium announces that an institute in rheumatic fever will be held for the first time on Oct. 12 and annually thereafter. This is the anniversary period of the opening of the hospital on Oct. 21, 1932. On Oct. 16 the trustees will dedicate the new Gertrude F. Pick Memorial Center for community service in rheumatic fever. On Robert A. Black Day, a lecture in Dr. Black's memory will be inaugurated. The five day institute will be conducted by members of the hospital staff and persons from the medical schools in Chicago with which the hospital is affiliated and by invited guests. It will be directed primarily to general practitioners, nurses, social workers, occupational therapists, and dentists. There will be scientific sessions and sessions for the public. Advance registration will be required for those who wish to attend the entire five day session. Visitors to individual sessions will be admitted by card on previous application. There will be no admission or tuition charge. Information will be supplied by circular on application to: Institute, La Rabida Sanitarium, E. 65th St. and South Shore Drive, Chicago 49.

MAINE

Emergency Poliomyelitis Equipment.—The Portland office of the National Foundation for Infantile Paralysis is acquiring information from hospitals throughout the state to determine their equipment resources, including iron lungs and hot pack machines. This information will be catalogued and used for emergency situations. Physicians may obtain information on the location of equipment by calling the Maine state office of the National Foundation for Infantile Paralysis at Portland 2-8353. After hours call Mr. George H. Hawkins, Bar Mills 52-11; Mr. Paul F. Hungerford, Westbrook 1312-J; or Miss Butkis, office secretary, Portland 4-3370.

MASSACHUSETTS

Dr. Wilinsky to Retire.—Dr. Charles F. Wilinsky, executive director, Beth Israel Hospital, Boston, will retire Sept. 1 after 25 years of service in the field of hospital administration. On retiring from his post as assistant health commissioner of the City of Boston last January, he was appointed consultant to the Boston Department of Health. In the current year, the Massachusetts Public Health Association presented him with the Lemuel Shattuck Award, and Suffolk University conferred on him an honorary doctorate. Dr. Cecil G. Sheps, who will succeed Dr. Wilinsky, is currently director of program planning and research professor at the University of North Carolina, Chapel Hill.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

NEW YORK

Eastman Gift to Hospital.—A gift of $1,200,000 from the Eastman Kodak Company makes up the difference between the funds available and the funds required to complete, including necessary equipment, the 245 bed Northside Hospital in Rochester. The eight story institution will be erected on a 75 acre tract on the west side of Portland Ave., just north of the city line. A new type of call system between patient rooms and nurses' stations is planned that will enable the nurse on duty to communicate directly with the patient.

New York City

Beekman-Downtown Hospital Dedicated.—The new $5,500,000 Beekman-Downtown Hospital, said to be the first voluntary general hospital to be built in Manhattan in 20 years, was recently dedicated. The building at Beekman and William streets, which replaces the structure at Beekman and Water streets, has a bed capacity of 170, and it will serve many more clinic or outpatients than formerly. Because the eight story

Beekman-Downtown Hospital

structure is built on two street levels, the new hospital has two main floors with access to the street. There are 31 private and semiprivate rooms, 115 ward beds, and 5 operating rooms. Dr. Robert H. Kennedy heads the medical board.

OHIO

Fetterman Memorial Fund.—Friends of the late Dr. Joseph L. Fetterman have established the Joseph L. Fetterman Memorial Fund for cancer research at Western Reserve University School of Medicine, Cleveland. Contributions for the fund may be sent to the medical school or to the Cleveland Chapter of the American Cancer Society.

Dr. Peters Goes to Tulane.—Lawrence Peters, Ph.D., associate professor in pharmacology at Western Reserve University School of Medicine, Cleveland, has been appointed professor of pharmacology, Tulane University of Louisiana School of Medicine, New Orleans, to succeed Dr. Ralph G. Smith, who resigned in 1950 to join the U. S. Food and Drug Administration. Dr. Peters from 1942 to 1944 served in the medical research division of Sharp and Dohme, Inc. He has been affiliated with the Western Reserve University School of Medicine in Cleveland since that time and in 1950 was appointed a scholar in medical science by the John and Mary R. Markle Foundation.

PENNSYLVANIA

Gavel of Mastodon Ivory.—The Philadelphia County Medical Society has received from Dr. George E. Pfahler, Philadelphia, a gavel made of mastodon ivory obtained in Alaska. In presenting the gavel he said: "The mastodons in Alaska were present in the Pleistocene Period, probably 25,000 years ago, when Alaska had a tropical climate. . . ." Dr. Pfahler recently presented a similar gavel to the American College of Radiology.

Personal.—Dr. John R. Simpson, Huntingdon, was honored at the annual alumni luncheon of his alma mater, Franklin and Marshall College, Lancaster, when the alumni medal for distinguished service to the college and the alumni association was presented to him.——Dr. J. Lumen Popp, New Castle, was recently honored at the Elks Home when the Fraternal Order of Police presented him with a badge as honorary chief of police and a certificate of honor that stated that he had given his efforts unselfishly in behalf of the police.——Dr. Leroy E. Chapman, Warren, received an honorary degree at the 70th commencement exercises of the Philadelphia Textile Institute in Germantown on June 13. Dr. Chapman has been a member of the state senate since 1930. He holds honorary degrees from Hahnemann Medical College and Hospital of Philadelphia, Temple University, and Woman's Medical College of Pennsylvania, Philadelphia.

Philadelphia

University News.—The National Foundation for Infantile Paralysis has made a five year March of Dimes grant of $120,000 to the University of Pennsylvania School of Medicine, where the new rehabilitation center for aid of the physically handicapped will soon be in operation. The center will be directed by a commission on rehabilitation composed of department heads in the medical school and hospital of the University of Pennsylvania, with Dr. George Morris Piersol as chairman. Dr. William Dunbar, associate in medicine, public health, and preventive medicine, has been appointed coordinator of rehabilitation to promote the rehabilitation teaching program in the medical school and to maintain contacts between the university hospital and the outside agencies that will cooperate in the various phases of physical medicine and rehabilitation.

VERMONT

Expand Cardiac Program.—A training grant of $13,867 to the University of Vermont College of Medicine, Burlington, by the National Heart Institute will be used to expand the college teaching program in heart diseases, according to an announcement from Dr. George A. Wolf Jr., dean. Dr. Ellsworth L. Amidon, professor of medicine, will act as training program director. Facilities of the heart unit of the Bishop deGoesbriand Hospital will be developed under Drs. Wilhelm Raab and Eugene Lepeschkin.

WEST VIRGINIA

State Medical Meeting at White Sulphur Springs.—The annual meeting of the West Virginia State Medical Association will be held at the Greenbrier, White Sulphur Springs, July 23-25, under the presidency of Dr. James S. Klumpp, Huntington. A symposium on pain will open the scientific sessions Thursday morning, with Dr. Oscar B. Biern, Huntington, as moderator. Participants will be Dr. Bayard T. Horton, Rochester, Minn., "Headache: General Consideration"; Dr. Albert I. Mendeloff, St. Louis, "Practical Application of Recent Studies in Abdominal Pain"; and Dr. Frank H. Mayfield, Cincinnati, "Relief of Intractable Pain." A panel discussion will follow. Thursday afternoon Dr. Pat A. Tuckwiller, Charleston, will preside at a clinical pathological conference. At 6 p. m., a social hour will precede the Medical College of Virginia alumni dinner at which Dr. Jacob C. Huffman, Buckhannon, president of the West Virginia chapter, will be in charge. Thursday evening has been designated auxiliary night. A "chuck wagon" dinner in the Colonnades dining room will be

followed by an old-fashioned square dance in the ballroom. Friday morning a symposium on emergencies in general practice will be moderated by Dr. James L. Patterson, Logan. Participating will be Dr. Thomas M. Durant, Philadelphia, "Cardiovascular Emergencies in General Practice"; Dr. Clarence Dennis, Brooklyn, "Surgical Emergencies"; Dr. Charles S. Stevenson, Detroit, "Obstetric and Gynecologic Emergencies"; and Dr. Edward L. Bortz, Philadelphia, "Medical Emergencies in Senior Citizens." A panel discussion, "What's New?" will follow.

Dr. Klumpp will deliver the presidential address "The Price of Glory" at 9:30 p. m. Friday, after which Dr. Edward J. McCormick, Toledo, Ohio, President of the American Medical Association, will speak on "The Public Service of the American Medical Association." On Saturday Dr. Theodore P. Mantz, Charleston, will serve as moderator for the following program: "Management of the Hard of Hearing Patient," Dr. Richard E. Marcus, Chicago; "Diagnosis of Bone Tumors," Dr. Vincent W. Archer, Charlottesville, Va.; "Surgery of Trauma," Dr. Edward J. McCormick; and "A Doctor's Responsibility in the Changing Order," Dr. Howard A. Rusk, New York. A question and answer period will follow. Dr. Dean L. Hosmer will moderate a symposium on low back pain, in which collaborators will be Drs. Robert W. Johnson Jr., Baltimore, Frank H. Mayfield, Cincinnati, Vincent W. Archer, Charlottesville, Va., and Charles S. Stevenson, Detroit.

WISCONSIN

Course in Obstetrics.—The University of Wisconsin Medical School, Madison, will present a postgraduate course in obstetrics, Sept. 1-3, under the direction of Dr. John W. Harris and with the cooperation of all members of the department of obstetrics and gynecology. Dr. Curtis J. Lund, professor of obstetrics and gynecology, University of Rochester (N. Y.) School of Medicine and Dentistry, will be the guest faculty member.

Personal.—Dr. Mildred E. Scott, who has been with the U. S. Public Health Service on loan to the Florida and Oregon state boards of health since 1949, has been appointed director of the state board of health's division of tuberculosis and heart disease control.——Dr. Frank F. Newell was recently honored at a meeting of the Kiwanis Club of Burlington, where he has practiced for more than 50 years and where his father, the late Dr. George Newell, and his brother, the late Dr. G. Warren Newell, also practiced.

Appoint Head of Pathology Department.—Dr. Joseph F. Kuzma, Milwaukee, has been named director of the pathology department at Marquette University School of Medicine, Milwaukee, to succeed Dr. W. A. Douglas Anderson, now chairman of the pathology department at Jackson Memorial Hospital, Miami, Fla. A member of Marquette's medical faculty for 13 years, Dr. Kuzma has been promoted to the rank of professor. He has resigned as director of laboratories at Milwaukee County Hospital to accept full-time appointment.

Academy Essay Contest.—The Milwaukee Academy of Medicine and the Rogers Memorial Sanitarium offer prizes of $200 and $100 for the two most meritorious studies in neurology, psychiatry, and psychosomatic medicine. The contest is open to all members of the profession who are citizens of Wisconsin, whether actually in residence or not, and to those who, while not ordinarily residents of the state, are stationed in Wisconsin in the armed forces. Papers must be submitted in triplicate, double spaced, to the office of the Academy of Medicine, 561 N. 15th St., Milwaukee 3, not later than Dec. 1.

WYOMING

State Medical Election.—At the annual meeting in Casper, the Wyoming State Medical Society elected Dr. James W. Sampson, Sheridan, president, Dr. Bernard J. Sullivan, Laramie, president-elect, Dr. Nels A. Vicklund, Thermopolis, vice-president, Dr. Royce D. Tebbet, Casper, secretary, and Dr. Curtis L. Rogers, Sheridan, treasurer. The 1954 meeting will be held in Sheridan during the first part of June.

GENERAL

Fellowship in Tuberculosis.—The New York Tuberculosis and Health Association announces that the James Alexander Miller Fellowship for Research, with an annual stipend of $5,000, will be available from July 1, 1954, to June 30, 1955. The fellowship is designed to support a qualified medical investigator who will devote full time to a research project with a definite bearing on tuberculosis. Awards will be announced Dec. 1. Application forms will be supplied on request by the New York Tuberculosis and Health Association, 386 Fourth Ave., New York 16.

Rheumatology Prize.—Under the patronage of the Societa Italiano di Reumatologia, Acqui's Health Resort office announces an international competition for an original, unpublished medical article dealing with the physiopathology, clinical history, and therapy of rheumatic and arthritic diseases. The prize of 1 million Italian liras (approximately $1,600) will be awarded by the international judging commission. Articles may be written in Italian, French, English, Spanish, or German. The competition will close Jan. 31, 1954. For information, apply to the Azienda Autonoma di Cura—Acqui (Piemonte, Italy).

Damon Runyon Cancer Grants.—The Damon Runyon Memorial Fund for Cancer Research, Inc., announces that since its inception in 1946, its nationwide grants have totaled $6,708,347 to 246 fellows and 166 institutions in 46 states, the District of Columbia, and 14 foreign countries. Among the institutional grants for May, the largest ($46,000) was made to Memorial Center for Cancer and Allied Diseases for two projects under the direction of Dr. Cornelius P. Rhoads: "Studies on Serum Iodine and Serum Protein in Relation to Thyroid Function and to Treatment with Radioiodine" and "Clinical Studies of Viruses as Antineoplastic Agents."

WHO to Commemorate Nightingale Centennial.—The executive board of the World Health Organization, at a recent session in Geneva, supported a Uruguayan proposal for the suitable commemoration in 1954 of the 100th anniversary of the work started by Florence Nightingale in providing nursing assistance to the sick and in the organization of nursing services. The board suggested that the theme for World Health Day in 1954 be some subject related to the role of nursing in public health, including reference to the work of Florence Nightingale. The seventh World Health Assembly will be convened at the Palais des Nations, Geneva, May 4, 1954, and the next meeting of the executive board will begin in Geneva Jan. 12, 1954.

Palmer Fellowships Awarded.—Recipients of the first two-year Lowell M. Palmer Senior Fellowships in the Medical Sciences (*J. A. M. A.* **151:**397 [Jan. 31] 1953), totaling $88,000, have been announced by Dr. Walsh McDermott, associate professor of medicine, Cornell University Medical College, New York, and Dr. Geoffrey W. Rake, medical director, E. R. Squibb & Sons, chairman and vice-chairman, respectively, of the selection board of the Lowell M. Palmer Fund. The fellows and their fields are Dr. Joseph Dancis, New York University College of Medicine (physiology of newborn);. Dr. Franklin W. Heggeness, University of Rochester School of Medicine and Dentistry (physiology of gastrointestinal tract); Dr. Charles A. LeMaistre, Cornell University Medical College, New York (chronic bacterial infections); Dr. William R. Milnor, Johns Hopkins University School of Medicine, Baltimore (cardiovascular research); Dr. David T. Karzon, University of Buffalo School of Medicine (viral infections); and Dr. Maurice S. Raben, Tufts College Medical School, Boston (pituitary hormones).

Incidence of Leprosy.—According to reports from the American Geographical Society, there are about 2,000 cases of leprosy in the United States. All of the known cases in the United States are being or have been treated at the U. S. Marine Hospital (National Leprosarium) in Carville, La. The most heavily infected areas in the world are in Oceania, the East Coast of India, Northern Burma, and tropical Africa. The least infected locations are in Western Europe and in the

northern part of the Western Hemisphere. The significant rates of infection range from 0.008 per 1,000 in Tlaxcala State in Mexico, the least infected of the affected areas, to some 200 per 1,000 in the most seriously infected place, Easter Island. The world total of leprosy cases is estimated at about 5 million. The Leonard Wood Memorial, various religious groups, and the American Geographical Society plan to distribute a new map showing the world distribution of leprosy to every member attending the Sixth International Congress of Leprosy in Madrid in October, 1953.

Urological Research Foundation, Inc.—The American Urological Association recently authorized organization of the American Urological Research Foundation, Inc. The foundation, chartered in Ohio, elected Dr. Charles C. Higgins, Cleveland, president; Dr. Carl F. Rusche, Los Angeles, vice-president; Dr. Thomas D. Moore, Memphis, Tenn., secretary; and Dr. Reed M. Nesbit, Ann Arbor, Mich., treasurer. The foundation is on a nonprofit basis, and all contributions will be used in urological research, except for minimal administrative expenses. The officers and trustees serve without compensation. In addition to an initial donation of $25,000 authorized by the parent organization, a number of contributions have already been received, and the following grants have been approved by the board of trustees: $2,500 to Dr. Perry B. Hudson of Francis Delafield Hospital at Columbia University College of Physicians and Surgeons, New York, for a study of urinary steroid patterns in the postadrenalectomy state, and $3,850 to Dr. Thaddeus S. Danowski of the Children's Hospital, University of Pittsburgh School of Medicine, for studies on the renotropic property of growth hormone in chronic renal disease.

Methodist Hall of Fame.—Two of the five new members added to the Methodist Hall of Fame in Philanthropy in 1953 are physicians. A total of 26 persons have been thus honored since 1949. At the annual meeting of the National Association of Methodist Hospitals and Homes, this honor was accorded to (1) Dr. Malcolm Thomas MacEachern, Chicago, ". . . Physician, teacher, administrator . . . interested in hospitals and exercising notable influence in the constant lifting of their standards of service—sought after for assistance in problems of curriculum, organization, administration, and generous in response . . . recognized by his colleagues for ability and character . . . as a citizen of the world he has put continents in his debt," and (2) Dr. Watson S. Rankin, Charlotte, N. C., "North Carolina State Health officer for 16 years. Trustee, the Duke Endowment, since 1925—director, Hospital and Orphans Sections, The Duke Endowment, 25 years—giving a lifetime of service to the sick, suffering and needy through the administration of assistance by the Duke Endowment to thousands of orphan children . . . without regard to race or creed. A physician-administrator without peer, but above all in his living a true interpreter of the Christian religion and a follower of the teachings of the Great Physician."

Society News.—At its recent meeting, the American Ophthalmological Society elected Dr. William L. Benedict, Rochester, Minn., president, Dr. Everett L. Goar, Houston, Texas, vice-president, Dr. Maynard C. Wheeler, New York, secretary-treasurer, and Dr. Gordon M. Bruce, New York, editor.——The American Broncho-Esophagological Association recently elected Dr. Edwin N. Broyles, Baltimore, president, Dr. Leighton F. Johnson, Boston, vice-president, Dr. F. Johnson Putney, Philadelphia, secretary, Dr. Clyde A. Heatly, Rochester, N. Y., treasurer, and Dr. Francis W. Davison, Danville, Pa., editor.——At the annual scientific session of the American Dermatological Association in Lake Placid, N. Y., Dr. Louis A. Brunsting, Rochester, Minn., was elected president, Dr. George C. Andrews, New York, vice-president, Dr. J. Lamar Callaway, Durham, N. C., secretary, and Dr. Frank C. Combes, New York, treasurer.——At the annual meeting of the American Neurological Association in Atlantic City, N. J., the following officers were elected: president, Dr. Roland P. Mackay, Chicago; president-elect, Dr. Percival Bailey, Chicago; vice-presidents, Drs. William G. Lennox, Boston, and H. Russell Meyers, Iowa City; secretary-treasurer, Dr. H. Houston Merritt, New York; and assistant secretary, Dr. Charles Rupp, Philadelphia.——At the annual convention, the American College of Cardiology installed Dr. Robert P. Glover, Philadelphia, president, and named Dr. Ashton Graybiel, Pensacola, Fla., president-elect; David B. Dill, Ph.D., U. S. Army Chemical Center, Md. (physiology), Dr. Hubert Mann, New York, and John C. Krantz Jr., Ph.D., Baltimore (pharmacology), vice-presidents; Dr. Philip Reichert, New York, secretary; and Dr. Seymour Fiske, New York, treasurer.——At the annual meeting in New York, the American College of Chest Physicians elected Dr. Alvis E. Greer, Houston, Texas, president, Dr. William A. Hudson, Detroit, president-elect, Drs. James H. Stygall, Indianapolis, and Herman J. Moersch, Rochester, Minn., vice-presidents, and Dr. Charles K. Petter, Waukegan, Ill., treasurer.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories, and possessions in the weeks ended as indicated:

Area	June 27, 1953		June 28, 1952
	Paralytic Type	Total Cases Reported	Total
New England States			
Maine	..	1	3
New Hampshire	..	3	..
Vermont	..	..	1
Massachusetts	1	3	1
Rhode Island	1	2	..
Connecticut	..	6	2
Middle Atlantic States			
New York	4	28	21
New Jersey	..	6	3
Pennsylvania	..	12	4
East North Central States			
Ohio	4	21	22
Indiana	..	7	9
Illinois	4	18	8
Michigan	6	11	13
Wisconsin	..	4	10
West North Central States			
Minnesota	4	13	2
Iowa	1	1	20
Missouri	4	17	5
North Dakota	..	..	1
South Dakota	..	3	..
Nebraska	1	1	2
Kansas	..	10	19
South Atlantic States			
Delaware	..	..	..
Maryland	2	2	..
District of Columbia	..	2	1
Virginia	2	5	..
West Virginia	3	8	6
North Carolina	18	32	9
South Carolina	1	2	1
Georgia	2	18	16
Florida	3	9	10
East South Central States			
Kentucky	3	12	4
Tennessee	5	19	9
Alabama	23	39	8
Mississippi	..	27	26
West South Central States			
Arkansas	3	11	8
Louisiana	8	29	36
Oklahoma	3	20	22
Texas	9	63	206
Mountain States			
Montana	..	..	5
Idaho	..	1	..
Wyoming	..	1	2
Colorado	..	2	5
New Mexico	..	4	6
Arizona	..	3	2
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	1	14
Oregon	1	2	2
California	27	59	39
Territories and Possessions			
Alaska	..	3	..
Hawaii	1	1	6
Puerto Rico	..	..	..
Total	144	542	589

FOREIGN

Home Fatalities in Britain.—According to a current Home Office report, domestic accidents in Britain outnumber traffic fatalities: 48,000 road deaths were reported from 1940 to 1949 and 60,000 fatalities as a result of falls, burns, scalds, suffocation, and gas poisoning in the home.

Journées Médicales.—The societies of general medicine of France, the French Union, and foreign countries are invited to participate in the Journées Médicales, which will be held in Paris, April 21-25, 1954. Request for enrollment should be sent to the Secretariat of the Journées, 12, rue Pierre-Geofroix, Colombes (Seine). Enrollment is free to the participating societies, each of which will be entitled to present a report on a subject of its own choice. The name of the reporter and the subject chosen should be sent to the secretariat before Oct. 1. In addition to free communications, one session will be devoted to study and discussion of "The Prolongation and Improvement of Life by Prophylaxis of Atherosclerosis."

Congress of Leprosy.—The Sixth International Congress of Leprosy will be held in Madrid, Spain, on Oct. 3-10. Main subjects for discussion are treatment with new drugs, immunology, revision of classification, and control of leprosy. Titles and short abstracts of papers to be read at the congress should be sent to the general secretary of the organizing committee, Felix Contreras, Moreta 15, Madrid. Abstracts should be limited to 200 to 300 words, papers written by individual persons to 1,500 words, and papers written jointly to 2,000 words. Notice of intention to attend the congress should be sent to the General Secretary, International Leprosy Association, 167 Victoria St., London, S.W.1, before the end of July. The registration fee for members is $10 and for nonmembers $20; for persons accompanying members who register for attendance at social functions it is $5.

International Meeting on Military Medicine.—The International Committee of Military Medicine and Pharmacy announces that the 16th session of the International Office of Documentation of Military Medicine and Pharmacy will be held in Rome by invitation of the Italian government, Oct. 14-18. All officers of the military, naval, and air health services, active or reserve, are invited to participate. The program will include presentation of reports on the resolutions adopted by the 15th session on (1) international medical law (development of the question) and (2) the international insignia of army health services. The results of international research on the organization of pharmaceutical services in armies, the organization of dental and stomatological services, and female sanitary personnel in armies will be presented. Enrollment should be made before Sept. 1. Reduced railroad rates will be available. Information may be obtained from Col. Medecin Prof. A. Campana, secretary of the 16th session of the Office, Ministero della Difesa, Esercito, Rome.

DEATHS IN OTHER COUNTRIES

Dr. Frederick William Edridge-Green died April 18, aged 89. He invented the color perception spectrometer and color perception lantern used in the British navy's official color test. He was the Hunterian Professor and the Arris and Gale Lecturer at the Royal College of Surgeons.

CORRECTIONS

Instrument for Continuous Recording of Body Temperature.—In the clinical note by this title in THE JOURNAL, June 13, 1953, page 610, the credit line at the bottom of the page should read as follows: From the Department of Surgery, Maimonides Hospital, and the State University of New York, College of Medicine, New York.

Carcinoma of the Stomach.—In the last sentence of the article by this title in THE JOURNAL, April 18, 1953, page 1384, the statement is made "The resectability rate increased 48%, the hospital mortality rate decreased to zero, and the five year survival rate increased 20%." The statement that "the hospital mortality rate decreased to zero" is in error. The fact is that from 1940 to 1949 there was a 100% improvement in the mortality rate as compared with the patients operated on the period 1907 to 1937, the mortality rate in the earlier period being 16% and that in the later period being 8%.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALASKA:* Anchorage and Juneau, Sept. 7. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

COLORADO:* *Reciprocity.* Denver, July 14. Final date for filing applications was June 12. Exec. Sec., Mrs. B. H. Hudgens, 831 Republic Bldg., Denver. 2.

CONNECTICUT:* *Regular. Examination.* Hartford, July 14-15. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 14-15. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: Dover, July 14-16. Sec., Dr. Joseph S. McDaniel, 229 South State St., Dover.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. Austin W. Matthis, Agana.

HAWAII: *Examination.* Honolulu, July 13-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 13-15. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

MAINE: *Reciprocity and Examination.* Augusta, July 14-15 Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: *Examination.* Boston, July 14-17. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston 33.

MONTANA: Helena, Oct 5. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEW HAMPSHIRE: Concord, Sept. 9. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW MEXICO:* Oct. 12-13, Santa Fe. Sec., R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NORTH CAROLINA: *Reciprocity.* Blowing Rock, Aug. 1. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July. Act. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

TEXAS: Fort Worth, Nov. 12-14. Reciprocity applicants must be completed 30 days prior to the meeting date. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination.* Salt Lake City, July. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City.

WASHINGTON:* Seattle, July 12-15. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WEST VIRGINIA: Charleston, July 13-15. Sec., Dr. N. H. Dyer, State Office Bldg., Charleston 5.

WISCONSIN:* *Examination.* Milwaukee, July 14-16. Sec., Dr. A. G. Koehler, 46 Washington Blvd., Oshkosh.

PUERTO RICO: *Reciprocity.* Santurce, Aug. 4. Sec., Mr. Luis Cueto Coll, Box 9156, Santurce.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

COLORADO: *Examination.* Denver, Sept. 9-10. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

DISTRICT OF COLUMBIA: *Examination.* Washington, Oct. 19-20. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

IOWA: Des Moines, July 14. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

OKLAHOMA: *Examination.* Oklahoma City, August 28-29. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: Portland, Aug. 29. Final date for filing application is Aug. 12. Portland, Dec. 5. Sec., Dr. Charles D. Byrne, University of Oregon, Eugene.

TEXAS: *Examination.* Austin, October. Chief Clerk, Mrs. Sandra Allen, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination.* Madison, Sept. 19. Final date for filing application is Sept. 11. Milwaukee, Dec. 5. Final date for filing application is Nov. 27. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

* Basic Science Certificate required.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1953 Clinical Session, St. Louis, Dec. 1-4.
1954 Annual Session, San Francisco, June 21-25.
1954 Clinical Session, Miami, Florida, Nov. 30-Dec. 3.
1955 Annual Session, Atlantic City, N. J., June 6-10.
1955 Clinical Session, Boston, Nov. 29-Dec. 2.

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Sitka, July 15-17. Dr. William P. Blanton, P. O. Box 2569, Juneau, Secretary.

AMERICAN CONGRESS OF PHYSICAL MEDICINE, Palmer House, Chicago, Aug. 31-Sept. 4. Dr. Walter J. Zeiter, 30 North Michigan Ave., Chicago 2, Executive Director.

AMERICAN DIETETIC ASSOCIATION, Los Angeles, Aug. 24-28. Miss Ruth M. Yakel, 620 N. Michigan Ave., Chicago 11, Executive Secretary.

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY, Commander and Continental Hotels, Cambridge, Mass., Aug. 17-22. Dr. John A. Abbott, Massachusetts General Hospital, Boston 14, Secretary.

AMERICAN HOSPITAL ASSOCIATION, San Francisco, Aug. 31-Sept. 3. Mr. George Bugbee, 18 East Division St., Chicago 11, Executive Director.

AMERICAN VETERINARY MEDICAL ASSOCIATION, Royal York Hotel, Toronto, Canada, July 20-23. Dr. J. G. Hardenbergh, 600 South Michigan Blvd., Chicago 5, Executive Secretary.

BIOLOGICAL PHOTOGRAPHIC ASSOCIATION, Hotel Statler, Los Angeles, Aug. 31-Sept. 3. Miss Jane H. Waters, 533 West 57th St., New York 19, Secretary.

GERONTOLOGICAL SOCIETY, Mark Hopkins Hotel, San Francisco, Aug. 25-27. Dr. Nathan W. Shock, Baltimore City Hospitals, Baltimore 24, Secretary.

NATIONAL MEDICAL ASSOCIATION, Nashville, Tenn., Aug. 10-14. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., Executive Secretary.

POST GRADUATE MEDICAL ASSEMBLY OF SOUTH TEXAS, Shamrock Hotel, Houston, July 20-22. Dr. C. A. Dwyer, 229 Medical Arts Bldg., Houston, Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:
WEST VIRGINIA, White Sulphur Springs, July 24. Dr. Paul H. Revercomb, 1031 Quarrier St., Charleston 1, Governor.

SOCIETY OF AMERICAN BACTERIOLOGISTS, Palace Hotel, San Francisco, Aug. 10-14. Dr. John H. Bailey, Sterling-Winthrop Research Institute, Rensselaer, N. Y., Secretary.

WEST VIRGINIA STATE MEDICAL ASSOCIATION, The Greenbrier, White Sulphur Springs, July 23-25. Mr. Charles Lively, P. O. Box 1031, Charleston 24, Executive Secretary.

FOREIGN

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND, Leeds, England, May 13-15, 1954. Dr. Henry W. S. Wright, 45 Lincoln's Inn Fields, London W.C.2, England, Honorary Secretary.

BRITISH MEDICAL ASSOCIATION, Cardiff, S. Wales, July 13-17. Dr. A. MaCrae, B. M. A. House, Tavistock Square, London W.C.1, England, Secretary.

CANADIAN MEDICAL ASSOCIATION, Vancouver, B. C., Canada, June 18-22, 1954. Dr. T. C. Routley, 135 St. Clair Ave. W., Toronto 5, Ont., Canada, General Secretary.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Chateau Frontenac, Quebec, Canada, October 26-29. Dr. A. William Friend, 515 Nome Ave., Akron 20, Ohio, Chairman, Program Committee.

CONGRESS OF THE INTERNATIONAL ASSOCIATION OF LIMNOLOGY, Cambridge and Windermere, England, Aug. 20-30. For information write: Professor G. C. Hutchinson, Osborn Zoological Laboratory, Yale University, New Haven, Conn., U. S. A.

CONGRESS OF THE INTERNATIONAL LEAGUE AGAINST RHEUMATISM, Geneva, Switzerland and Aix-les-Bains, France, Aug. 23-29. For information write: Dr. W. Tegner, The London Hospital, London E.1, England.

CONGRESS OF THE INTERNATIONAL SOCIETY OF ANGIOLOGY, Lisbon, Portugal, Sept. 18-20. Dr. Henry Haimovici, 105 East 90th St., New York 28, N. Y., U. S. A., Secretary.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Lisbon, Portugal, Sept. 14-20. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, General Secretary.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 15-19, 1954. Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS OF ACUPUNCTURE, Kolpinghaus, Adolf-Kolping-Strasse 1, Munich, Germany, August 22-25. Dr. G. Bachmann, 29 Lilienstrasse, München 9, Germany, Organizer and Secretary.

INTERNATIONAL CONGRESS OF ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY, Boston, Mass., U. S. A., Aug. 18-21. Dr. Robert S. Schwab, Massachusetts General Hospital, Boston 14, Mass., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF THE EUROPEAN SOCIETY OF HAEMATOLOGY, Amsterdam, Holland, Sept. 8-12. Dr. M. C. Verloop, Maliesingle 15, Utrecht, Holland, Secretary.

INTERNATIONAL CONGRESS ON GENETICS, Bellagio, Italy, August 24-31. Prof. C. Barigozzi, Instituto de Genetica, Universita de Milano, 10 via Celoria, Milan, Italy, Secretary.

INTERNATIONAL CONGRESS OF HIPPOCRATIC MEDICINE, Evian, France, Sept. 3-6. Prof. P. Delore, 13, rue Jarente, Lyon, France, Secretary-General.

INTERNATIONAL CONGRESS FOR HISTORY OF SCIENCE, Jerusalem, Israel, August 3-7. Prof. F. S. Bodenheimer, Hebrew University, Jerusalem, Israel, President.

INTERNATIONAL CONGRESS OF HYDROCLIMATISM AND THALASSOTHERAPY, Dubrovnik, Yugoslavia, May 8-16, 1954. Prof. C. Plavsic, Zeleni Venac 1, Belgrade, Yugoslavia, Secretary General.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Sao Paulo, Brazil, April 26-May 2, 1954. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U.S.A., Secretary-General.

INTERNATIONAL CONGRESS OF LOGOPEDICS AND PHONIATRICS, Zurich, Switzerland, Sept. 1-5. Dr. Deso A. Weiss, 115 East 86th St., New York 28, N. Y., U. S. A., General Secretary.

INTERNATIONAL CONGRESS ON MEDICAL LIBRARIANSHIP, London, England, July 20-25. Mr. W. R. LeFanu, % London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, England, Chairman.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS OF MICROBIOLOGY, Rome, Italy, Sept 6-12. For information write: Dr. V. Puntoni, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNECOLOGY, Geneva, Switzerland, July 26-31, 1954. Dr. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Havana, Cuba, Oct. 12-17. Prof Felix Hurtado, 5a Avenue 124, Miramar, Havana, Cuba. President.

INTERNATIONAL CONGRESS OF PSYCHOLOGY, Montreal, Canada, June 7-12, 1954. For information write: Prof. H. S. Langfeld, International Union of Scientific Psychology, Eno Hall, Princeton University, Princeton, N. J., U. S. A.

INTERNATIONAL CONGRESS OF RADIOLOGY, Copenhagen, Denmark, July 19-25. Professor Flemming Norgaard, 10 Oster Voldgade, Copenhagen K, Denmark, Secretary General.

INTERNATIONAL CONGRESSES OF TROPICAL MEDICINE AND MALARIA, Istanbul, Turkey, Aug. 28-Sept. 4. Professor Dr. Ihsan Sükrü Aksel, Tunel Meydam, Beyoglu, Istanbul, Turkey, General Secretary.

INTERNATIONAL CONGRESS OF ZOOLOGY, Copenhagen, Denmark, Aug. 5-12. Dr. Anton F. Bruun, The University, Copenhagen, Denmark, Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL LEPROSY CONGRESS, Madrid, Spain, Oct. 3-10. Dr. Felix Contreras, Moreto 15, Madrid, Spain, Secretary.

INTERNATIONAL NEUROLOGICAL CONGRESS, Lisbon, Portugal, Sept. 7-12. Prof. Almeida Lima, Avenida do Brazil 53, Lisbon, Portugal, Secretary-General.

INTERNATIONAL OFFICE OF DOCUMENTATION OF MILITARY MEDICINE, Rome, Italy, Oct. 14-18. Colonel Medecin Prof. A. Campana, Office of the Ministero della Difesa-Esercito, Rome, Italy, Secretary.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Montreal, Canada, Aug. 31-Sept. 4. Dr. A. S. V. Burgen, Dept. of Physiology, McGill University, Montreal, Canada, Secretary.

INTERNATIONAL PSYCHO-ANALYTICAL CONGRESS, Bedford College, Regent's Park, London N.W.1, England, July 26-30. Dr. Ruth S. Eissler, 285 Central Park West, New York 24, N. Y., Hon. Secretary.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Basle, Switzerland, Sept. 18-19. For information write: Prof. Dr. F. Georgi, Neurologische Universitats-Poliklinik, Socinstrasse 55, Basle, Switzerland.

INTERNATIONAL VETERINARY CONGRESS, Stockholm, Sweden, Aug. 9-15. Prof. Axel Isaksson, Institute of Veterinary Medicine, Stockholm 50, Sweden, Secretary.

JOURNEES MEDICALES, Paris, France, April 21-25, 1954. For information write: Secretariat of the Journees, 12, rue Pierre-Geofroix, Colombes (Seine) France.

LATIN AMERICAN CONGRESS OF OBSTETRICS AND GYNECOLOGY, Buenos Aires, Argentina, Oct. 26-31.

LATIN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY, Caracas, Venezuela, Feb. 21-25, 1954. Dr. Victorino Marquez Reveron, Centro Medico, Caracas, Venezuela, Secretary-General.

PACIFIC SCIENCE CONGRESS, Quezon City and Manila, Philippines, Nov. 16-28. Dr. Patrocinio Valenzuela, College of Pharmacy, University of the Philippines, Quezon City, Philippines, Secretary-General.

PAN AMERICAN CONGRESS OF THE MEDICAL PRESS, Buenos Aires, Argentine, July 12-16. Secretaria del Congress, 763 Uriburu, Buenos Aires, Argentine.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, Mexico, D.F., Mexico, Feb. 28-March 4, 1954.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Beekman Towers Hotel, New York, N. Y., Sept. 24-Oct. 1. Dr. Ina Marsh, 140 Linwood Ave., Buffalo, N. Y., U. S. A., Registration Chairman.

PERSIAN GULF MEDICAL SOCIETY, Dhahran, Saudi Arabia, Dec. 7-8. Dr. N. J. Conan Jr., Department of Internal Medicine, Arabian American Oil Company, Dhahran, Saudi Arabia, Secretary.

SECTIONAL MEETING, AMERICAN COLLEGE OF SURGEONS, London, England, May 17-19, 1954. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Ill., U. S. A., Secretary.

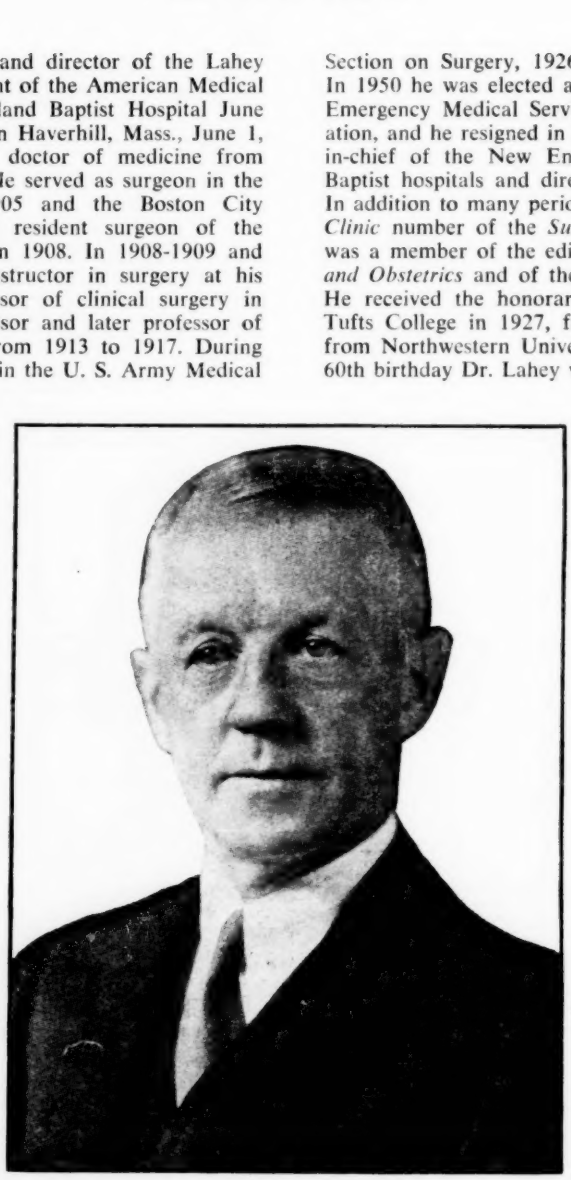
WORLD CONFERENCE ON MEDICAL EDUCATION, British Medical Association House, Tavistock Square, W.C.1, London, England, Aug. 22-29. Secretariat: World Medical Association, 2 East 103d St., New York 29, N. Y., U. S. A.

WORLD CONGRESS OF THE WORLD CONFEDERATION FOR PHYSICAL THERAPY, London, England, Sept. 7-12. Miss M. J. Neilson, Chartered Society of Physiotherapy, Tavistock House, South, Tavistock Square, London, W.C.1, England, Secretary.

WORLD MEDICAL ASSOCIATION, The Hague, Netherlands, Aug. 31-Sept. 7. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., Secretary-General.

DEATHS

Lahey, Frank Howard ⊕ founder and director of the Lahey Clinic in Boston and a past president of the American Medical Association; died in the New England Baptist Hospital June 27, aged 73. Dr. Lahey was born in Haverhill, Mass., June 1, 1880, and received the degree of doctor of medicine from Harvard Medical School in 1904. He served as surgeon in the Long Island Hospital in 1904-1905 and the Boston City Hospital, 1905-1907, and became resident surgeon of the Haymarket Square Relief Station in 1908. In 1908-1909 and from 1912 to 1915 he was an instructor in surgery at his alma mater, where he was professor of clinical surgery in 1923-1924. He was assistant professor and later professor of surgery at Tufts Medical School from 1913 to 1917. During World War I he served as a major in the U. S. Army Medical Corps and also as director of surgery in the American Expeditionary Forces Evacuation Hospital No. 30. An honorary consultant to the medical department of the U. S. Navy, and during World War II chairman of the Procurement and Assignment Service for Medical Personnel for Armed Forces, he was chairman of the Navy's medical board, inspecting nearly every naval hospital in the states and the Pacific. He was member and past president of the American Association for the Study of Goitre and the New England Surgical Society, member and fellow of the International Surgical Society, fellow and a member of the board of governors of the American College of Surgeons, an honorary fellow of the Royal College of Surgeons, England, a member of the American Surgical Association, Societé des Chirurgiens de Paris, Southern Surgical Association, American Urological Association, Theta Delta Chi, and the Association for the Study of Internal Secretions, and a member of the founders group of the American Board of Surgery. He was a member of the American Gastroenterological Association, which in 1946 awarded him the Friedenwald medal for his contributions to surgery of the digestive tract, and on May 10, 1946, he received the Henry Jacob Bigelow medal from the Boston Surgical Society. In the American Medical Association he was appointed by President Jabez N. Jackson at the Washington session in 1927 a member of the Council on Scientific Assembly for a term of five years and was reappointed for a five year term (ending in 1937) by President E. H. Cary at the New Orleans session in 1932. He was appointed by President Irvin Abell at the San Francisco session in 1938 as a member of the Council on Medical Education and Hospitals for a term of seven years and resigned following his election as President of the American Medical Association in 1940. He was also a member of the Advisory Committee to Cooperate with the Bureau of Medical Economics of the American Medical Association Outlining the Necessary Procedure for Making Studies and Reports of the Prevailing Need for Medical and Preventive Medical Service (later called the Committee on Medical Care), which was established by the Board of Trustees at its February, 1938, meeting. He was secretary of the Section on Surgery, 1926-1929, and its chairman, 1929-1930. In 1950 he was elected a member of the Council on National Emergency Medical Service of the American Medical Association, and he resigned in 1952. For some time he was surgeon-in-chief of the New England Deaconess and New England Baptist hospitals and director of surgery in the Lahey Clinic. In addition to many periodical articles, he published the *Lahey Clinic* number of the *Surgical Clinics of North America*. He was a member of the editorial boards of *Surgery, Gynecology and Obstetrics* and of the *New England Journal of Medicine*. He received the honorary degree of doctor of science from Tufts College in 1927, from Boston University in 1943, and from Northwestern University, Evanston, Ill., in 1947. On his 60th birthday Dr. Lahey was given a 466 page book containing scientific papers written in his honor by 50 world medical leaders.



FRANK HOWARD LAHEY, M.D., 1880-1953

Yeomans, Andrew ⊕ Norwich, Vt.; born in Chicago Dec. 20, 1907; Harvard Medical School, Boston, 1935; since 1947 assistant professor of clinical medicine at Dartmouth Medical School in Hanover, N. H.; research fellow in medicine at his alma mater, 1938-1939; in 1940-1941 instructor in medicine at Tufts Medical School, Boston, where he was associate physician at the Pratt Diagnostic Hospital; associate professor of preventive medicine at Johns Hopkins University School of Medicine and assistant visiting physician at Johns Hopkins Hospital in Baltimore, 1946-1947; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; during World War II served in the U. S. Naval Reserve as clinical director of the U. S. Typhus Commission Research Ward in Cairo, Egypt; chief of the medical service at the VA Hospital in White River Junction, Vt.; died in Hanover, N. H., April 17, aged 45, of Hodgkin's disease.

McGrath, John Joseph ⊕ Belmar, N. J.; born in New York City in 1868; College of Physicians and Surgeons, medical department of Columbia College, New York, 1889; formerly professor of operative surgery at New York Post-Graduate Medical School; served as professor of surgery at the New York Polyclinic Medical School and Hospital and the Fordham University School of Medicine in New York; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; past president of the board of trustees of the Bellevue and Allied Hospitals; consulting surgeon, New York Polyclinic Medical School and Hospital, Fordham and Columbus hospitals, and Norwalk (Conn.) General Hospital; author of "Operative Surgery for Students and Practitioners"; died in the Fitkin Memorial Hospital in Neptune, N. J., May 18, aged 85.

Williams, Ford Smith ⊕ Jackson, Miss.; born in Jackson Dec. 3, 1910; Louisiana State University School of Medicine, New Orleans, 1934; served with the U. S. Public Health Service during World War II; formerly director of the division of venereal diseases of the Louisiana State Board of Health, of which he was assistant director; at one time director of the West Carroll Parish Health Department in Oak Grove,

⊕ Indicates Member of the American Medical Association.

La., and St. Mary Parish Health Department in Franklin, La.; affiliated with Mississippi Baptist and Mississippi State Charity hospitals; died May 22, aged 42, of coronary thrombosis.

Achorn, Ralph Chase ✠ Swampscott, Mass.; Baltimore Medical College, 1908; died April 24, aged 73, of coronary occlusion.

Addison, Robert Perry ✠ Dallas, Texas; Baylor University College of Medicine, Dallas, 1926; member of the American Academy of General Practitioners; died in the Baylor University Hospital May 8, aged 53, of cardiac decompensation and hypertension.

Baird, Joseph Shannon ✠ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1916; assistant professor of pediatrics at University of Pittsburgh School of Medicine; member of the American Academy of Pediatrics; formerly vice-president of the Pittsburgh Pediatric Society; superintendent and medical director of the Municipal Hospital, where he died May 2, aged 63, of carcinoma of the head of the pancreas with metastases.

Brown, Robert A. ✠ Prague, Okla.; Baylor University College of Medicine, 1905; died March 23, aged 81, of coronary occlusion.

Brown, William Marmaduke ✠ Lexington, Ky.; University of Virginia Department of Medicine, Charlottesville, 1919; member of the American Academy of Orthopedic Surgeons; served with the Kentucky Commission for Crippled Children; formerly affiliated with the Shriners' Hospital for Crippled Children; died recently, aged 59.

Brust, Herbert Oscar ✠ Syracuse, N. Y.; Albany (N. Y.) Medical College, 1897; an Associate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Oto-Laryngology; formerly on the faculty of Syracuse University College of Medicine; vice-president of the board of trustees and chief of the ear, nose, and throat department, Crouse Irving Hospital, where he died April 30, aged 81, of arteriosclerosis.

Burge, H. Gideon ✠ Nettleton, Ark. (licensed in Arkansas in 1903); died in St. Bernard's Hospital, Jonesboro, April 28, aged 81.

Cunningham, Harvey Lee ✠ Cape Girardeau, Mo.; Missouri Medical College, St. Louis, 1889; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Ophthalmology; died April 26, aged 86, of senility.

Daly, Jeremiah James, Andover, Mass.; Tufts College Medical School, Boston, 1903; served on the board of health; died April 19, aged 77, of cerebral hemorrhage.

Eisenhardt, William G. ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1900; served on the staff of Episcopal Hospital; died April 22, aged 76, of cerebral hemorrhage.

Gallagher, Joseph Francis ✠ Col., U. S. Army, retired, Bradenton, Fla.; McGill University Faculty of Medicine, Montreal, Canada, 1914; entered the medical corps of the U. S. Army in September, 1919; served during World Wars I and II; retired Aug. 1, 1945; fellow of the American College of Surgeons; died in Tampa, April 25, aged 63, of emphysema, pulmonary fibrosis, and gastric ulcer.

Griot, George Augustus ✠ Springfield, Mo.; St. Louis University School of Medicine, 1910; on the staffs of the Burge Hospital and Baptist Hospital, where he died April 29, aged 72, of carcinoma of the cecum.

Hall, Walter George, Brooklyn; University of Pennsylvania School of Medicine, Philadelphia, 1949; resident, Kings County Hospital; died May 18, aged 30, of leukemia.

Hammel, Harry H. ✠ Tecumseh, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1915; served during World Wars I and II; for many years member of the board of education; on the staff of the Herrick Memorial Hospital, where he died May 19, aged 59, of coronary occlusion.

Headland, Courtenay Inglis ✠ Yonkers, N. Y.; Harvard Medical School, Boston, 1926; specialist certified by the American Board of Radiology; member of the American College of Radiology; affiliated with Lawrence Hospital in Bronxville and the Dobbs Ferry (N. Y.) Hospital; on the staff of the Yonkers General Hospital, where he died May 26, aged 52, of carcinoma of the soft palate.

Jensen, Jens Peter, Plainview, Neb.; University of Nebraska College of Medicine, Omaha, 1903; died in the Methodist Hospital, Omaha, April 6, aged 82, of heart failure.

Johnson, David Morrison ✠ Columbus, Ohio; Jefferson Medical College of Philadelphia, 1922; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; served during World War II; on the staffs of the Children's Hospital and the Grant Hospital, where he died May 14, aged 54, of cancer of the lung.

Johnson, Jens Andreas William ✠ Marshalltown, Iowa; University of Michigan Homeopathic Medical School, Ann Arbor, 1917; fellow of the American College of Surgeons; on the staffs of the Evangelical Deaconess and Mercy hospitals; died April 26, aged 67, of a heart attack.

Jones, Arthur John ✠ Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; affiliated with East Side General Hospital and St. Joseph's Mercy Hospital, where he died April 22, aged 72, of cerebral thrombosis and hypertensive arteriosclerotic heart disease.

Jones, Emlyn ✠ Davidsville, Pa.; Jefferson Medical College of Philadelphia, 1900; director of the state bureau of vital statistics, Harrisburg, from 1927 to 1935; for many years practiced in Johnstown; formerly county treasurer of Cambria County; in 1943 named deputy secretary of welfare by the state, serving until about a year ago; for many years coroner's physician; on the staff of Conemaugh Valley Memorial Hospital in Johnstown; died April 17, aged 76.

Klock, Guy Almeron, Daytona Beach, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; served on the staff of the Halifax District Hospital; died April 15, aged 77, of cerebral hemorrhage.

Le Pard, Sherman J., Jamestown, N. Y.; Syracuse University College of Medicine, 1909; died in Winchester (Va.) Memorial Hospital April 3, aged 73, of cerebral thrombosis and hypertensive vascular disease.

Lutgen, Anson S. ✠ Colby, Kan.; Lincoln Medical College of Cotner University, 1904; member of the American Association of Railway Surgeons; for many years practiced in Wayne, Neb., where he was college physician for the Nebraska State Teachers College, and city physician; surgeon for the Chicago, Burlington and Quincy Railroad; on the staff of St. Thomas Hospital, where he died April 23, aged 73, of cerebral hemorrhage.

McCracken, Jesse Lazear ✠ Smithfield, Pa.; Starling-Ohio Medical College, Columbus, 1911; died in Uniontown May 4, aged 67, of a heart attack.

MacDonald, John Joseph, Secaucus, N. J.; Yale University School of Medicine, New Haven, 1907; served during World War I; assistant medical director of Hudson County General Hospital; served on the staffs of St. Francis and Fairmont hospitals in Jersey City; formerly medical director of the skin clinic at the Medical Center of Jersey City, where he died April 16, aged 80.

Mahlatjie, Nathaniel M. S., Detroit; Meharry Medical College, Nashville, Tenn., 1930; died May 1, aged 53.

Martin, Pierce ✠ Fourmile, Ky.; Kentucky University Medical Department, Louisville, 1904; died March 19, aged 74, of carcinoma of the prostate.

Mitchell, Joseph Grover ✠ El Dorado, Ark.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; specialist certified by the American Board of Otolaryngology; affiliated with Warner Brown Hospital; died May 3, aged 68, of carcinoma of the colon.

GOVERNMENT SERVICES

ARMY

Koreans Grateful for Medical Books.—Taegu Medical College officials have shown their gratitude for aid given their institution by the Korean Communications Zone Surgeon by presenting Col. Byron L. Steger (Arlington, Va.) with an engraved scroll and silver tea set. An ovation from hundreds of Korean medical students massed in the college auditorium greeted the colonel, who was soon to leave to attend a course at the Army War College in the United States. Colonel Steger was instrumental in raising funds and equipment for the college. Hard hit by the Korean war economy, the college was at one time struggling along without textbooks and proper teaching facilities. Now the institution's library numbers professional books in the hundreds and has general surgical equipment. Its students and faculty receive refresher courses in English from Army physicians stationed in the KComZ Medical Section (THE JOURNAL Jan. 24, 1953, page 319).

NAVY

Admiral Groesbeck Retires and Goes to Indiana.—Rear Adm. Leslie O. Stone (MC) assumed command of the National Naval Medical Center, Bethesda, Md., on June 30, on the retirement of the then commanding officer, Rear Adm. Bertram Groesbeck Jr. Admiral Groesbeck's retirement followed more than 35 years of continuous active naval service. Immediately following his retirement, Admiral Groesbeck took up new duties in civil life as director of the department of public health of the state of Indiana, with headquarters at Indianapolis. He received the 1951 Lyster Award, which is presented annually by the Aero-Medical Association for outstanding achievements in aviation medicine. He recently was presented with the 1952 Good Government Award of the Bethesda Junior Chamber of Commerce and the Alumni Achievement Award of George Washington University for 1953.

PUBLIC HEALTH SERVICE

Federal Grants and Fellowships.—The United States Public Health Service announces that, beginning July 1, applications for postdoctoral and special research fellowships in the field of mental health, as well as in other health fields, will be reviewed twice rather than three times annually. Such applications should be submitted before Oct. 15 or Feb. 15. Awards will be announced about three months later. Research grant applications will continue to be reviewed three times a year, with the following closing dates for the coming year: Aug. 15, Nov. 1, and March 1. Awards will be announced from four to five months after the closing dates. Further information and application forms may be secured from John C. Eberhart, Ph.D., Chief, Research Grants and Fellowships Branch, National Institute of Mental Health, Bethesda 14, Md.

Radiological Health Training Program.—Short courses in radiological health are being presented by the Public Health Service at the Environmental Health Center in Cincinnati. These courses are tuition free and are designed primarily to provide professional personnel working in health departments and other organizations with a working knowledge of the health hazards associated with radiation. Candidates should have a degree in medicine, engineering, or science (physical or biological). Instruction is given in radiation physics sufficient for an understanding of the problems arising from use of ionizing radiation. Laboratory and lecture periods are presented covering the hazards and methods of alleviating these hazards, as encountered in employment of x-rays, radioisotopes, neutron fluxes, and particle accelerators.

Courses are two weeks in length. Basic courses, which stress basic radiation physics and survey techniques, will be presented on the following dates: Oct. 5-16, 1953, Jan. 11-22, 1954, and May 3-14, 1954. The basic course or its equivalent is a prerequisite for the intermediate course. Laboratory assay of radioelements and x-ray survey techniques are emphasized in the intermediate course, which will be presented on the following dates: Oct. 19-30, 1953, Jan. 25-Feb. 5, 1954, and May 17-28, 1954. Completion of the intermediate course or its equivalent is a prerequisite for admission to the advanced course. This course, for professional personnel concerned in particular with occupational health problems, will be presented on Feb. 8-19, 1954. Information may be obtained by writing to the Radiological Health Training Section, Public Health Service, Environmental Health Center, Cincinnati, Ohio.

Increase in Annual Birth Rate.—The national birth total set a new annual record of 3,889,000 births in 1952, according to statistical estimates released by the Public Health Service. Births during the first quarter of 1953 were running about 29,000 ahead of the same period last year. March was the 10th consecutive month in which the estimated total births topped corresponding monthly figures for the previous year. The level of births for the first three months is at an annual rate of 25 live births per 1,000 population.

Based on registered births alone, 58,000 more couples had a first child in 1951 than in 1950, according to preliminary estimates. This 5% increase in first-born children was largely a sequel to the marriage upswing that began in June, 1950, at the start of the Korean War. Births of second-born children increased by 2% over 1950. Births of third children increased by 9%, and of fourth children by 13%. These increases continue a steady rise that has been going on since the end of World War II.

Hospital News.—The U. S. P. H. S. Hospital at Fort Stanton, New Mexico, has stopped admitting patients, the Public Health Service announced June 1. The hospital, a tuberculosis sanatorium, will be closed as soon as patients now being treated there are transferred to other Service hospitals. The closure is necessary because of the curtailment of operating funds for the P. H. S. hospitals. In addition to the reduction in direct appropriations for the medical care of its beneficiaries, the Service will also lose reimbursements from the Veterans Administration for a daily average of 375 patients being cared for in general and tuberculosis hospitals. Some of the beds vacated through the withdrawal of veteran patients will be made available for tuberculosis patients. Patients from Fort Stanton will be cared for in the Public Health Service general hospitals at San Francisco, Seattle, New Orleans, and Chicago, and the tuberculosis sanatorium in Brooklyn. Persons eligible for medical care by the Public Health Service include merchant seamen, Coast Guardsmen, and federal employees stricken in line of duty.

VETERANS ADMINISTRATION

Residencies in Pathology in Texas Hospital.—The VA Hospital, Houston, Texas, has vacancies for residents in pathology. The residency is approved for four years' training in pathological anatomy and clinical pathology. The activities of the service are closely integrated with those of the departments of pathology, microbiology, and biochemistry of Baylor University College of Medicine. Stipends range from $2,640 to $3,300 per annum. Interested candidates should write to Dr. Lee D. Cady, Manager, Veterans Administration Hospital, Houston, Texas.

FOREIGN LETTERS

COLOMBIA

Yellow Fever.—Dr. Augusto Gast Galvis, director of the Carlos Finlay Instituto de Estudios Especiales of Bogotá, published an article on the epidemiology of yellow fever in the last four years in Colombia. The article appeared in *Revista de la Facultad de Medicina de Colombia* for December, 1952. The résumé of the work on which the article was based was reported by the author to the First Congress of Inter-American Hygiene in Havana, Cuba, Sept. 26 to Oct. 1, 1952. The campaign against yellow fever in Colombia is carried on by the Carlos Finlay Institute. The institute is supported by the Ministry of Hygiene of Colombia, with the cooperation of the Pan-American Sanitary Office of Washington. The work carried on in the country for several years by Colombian researchers, with the support of the national government, the Rockefeller Foundation and the Pan-American Sanitary Office, has been of great value in the continental crusade against yellow fever. Drs. R. Franco, J. Martínez Santamaría, and Gabriel Toro Villa in their research on the 1911 epidemics in the Muzo region described jungle yellow fever for the first time. Later further studies were carried on by Colombian researchers, mainly Drs. R. Serpa, L. Patiño-Camargo, J. Boshell-Manrique, A. Gast-Galvis, E. Osorno-Mesa, and M. Roca-Garcia, alone or with the collaboration of distinguished foreign scientists, mainly Drs. A. Peña Chavarría, G. Bevier, J. A. Kerr, J. C. Bugher, H. W. Kumm, M. Battes, and C. R. Anderson.

In Colombia, the last urban epidemics of yellow fever transmitted by Aedes aegypti occurred in Bucaramanga and Socorro in 1923 and 1929. In September and October, 1937, however, a small outbreak occurred in the Buenavista village (Caldas). It is difficult to ascertain whether Aedes aegypti or Haemagogus spegazzinni falco was the transmitting agent. The latter is abundant in the jungle near the village. From that year on, according to Dr. Gast Galvis, only the rural or jungle type of yellow fever has occurred. Generally the disease is endemic, with small epidemic outbreaks. The endemic foci are relatively far from the coastal zones on both oceans. They occur in the mountainous zones of the interior of the country and, with preference for the hilly zones near the valleys, at altitudes between sea level and 1,600 m. above sea level. The majority of well-known foci are at altitudes of between 400 and 800 m. above sea level. Single cases of yellow fever that occurred simultaneously in several regions of the country were revealed by viscerotome studies of the liver of persons who died after an illness of 10 days' duration. In the regions of tropical jungle in which cases of yellow fever have occurred, there are many apes. In other endemic foci in which the primitive jungle was destroyed and colonization established, simian apes are scarce but marsupials are abundant. The role of marsupials in the epidemiology of yellow fever has been proved by serologic studies. There are eight species of Haemagogus mosquitos in the country. It has been proved that only Haemagogus spegazzini falco is a capable vector in nature. It is observed in all places in which yellow fever in human beings occurred. The data of the department of viscerotomy of the Carlos Finlay Institute showed, as revealed by examination of more than 34,000 specimens of human livers taken by viscerotomy, that yellow fever is more frequent in males than in females after the age of 10 years. This is particularly true in adults between the ages of 20 and 29 years. This seems to be natural, because the studies were made on cadavers of rural persons among whom only the men work in the jungle and consequently are more exposed than women to the disease. Between 1935 and 1951 the virus of yellow fever was identified from 26 different persons. The total number of cases of yellow fever, as proved by the results of studies of the liver between 1934 and 1952, was 525. Its frequency indicates that the disease occurs in cycles with a periodic increase in the number of cases nearly every four or six years. The greatest and smallest numbers of cases were reported in 1947 and 1949, with 77 and 3 cases respectively. In the last four years, 53 proved cases of yellow fever have been reported from already known endemic regions. The disease has disappeared in human beings in places with small changes in the population where a constant vaccination program has been maintained. This has been the case in the Muzo municipality, in which no cases have occurred since 1948, whereas for 40 consecutive years before 1948 the disease appeared frequently.

Personal.—Dr. G. Pittaluga of the Instituto Carlos Finlay of Havana, Cuba, came to Bogotá in answer to the invitation of the Ministry of National Education the second week of December, 1952. He gave interesting lectures on "Diseases of Blood," "Diseases of the Reticuloendothelial System," and "Psychology of Women."——Dr. R. D. Adams, neurologist of the Massachusetts General Hospital, visited Bogotá during the first two weeks of March in answer to an invitation of the Sociedad Colombiana de Medicina Interna. He gave a course of neurology that included theoretical lectures and practical sessions in hospitals.

LONDON

Irish Physicians' Disapproval of "White Paper."—An editorial in the Irish Medical Association's journal says that Irish physicians' disapproval of the "White Paper" on improved health services has been confirmed by the pronouncements of Dr. James Ryan, Minister of Health. Headed, "Why We Disapprove," the editorial challenges Dr. Ryan to explain how, with "a bare 1,500 maternity beds" at his disposal, he will fulfill the promise of skilled professional attendance to the mothers of 65,000 babies born annually in the republic. Quoting the 1,120 million dollar bill of the British health services, the editorial says: "Stage by stage in Britain, notwithstanding her centuries of experience in treasury work, there has been gross miscalculation. In this smaller, poorer country, can the taxpayers and ratepayers face with equanimity the prospect of similar miscalculation at a time when the purchasing power of the pound has been officially quoted in the Dail at $1.25?"

Replacement of Dentures.—The Denbighshire and Flintshire Executive Council has had problems in connection with claims for replacement of dentures. The council decided that a man who left his teeth in a tumbler on a dressing table, where they were seized and chewed by a dog that came through the window, had shown lack of care and would have to pay for a replacement. A man who said his denture fell into the fire while he was showing it to his wife and two persons who lost their false teeth while bathing will also have to pay. A woman whose denture broke in two while she was chewing an apple will get a free replacement, but a man whose upper denture snapped while he was eating a meal and who tried to repair it himself will not.

Cystic Disease of Breast.—Patey and Nurick of the Middlesex Hospital, reporting in the *British Medical Journal* (**1**:15 [Jan. 3] 1953), have been investigating a series of cases of breast disease. Among 535 consecutive cases, there were 76 cases of cystic disease, which were treated conservatively; 65 of these were followed for from 1 to 16 years. In only one is carcinoma known to have developed, and that in the opposite breast. Sixty-four patients were treated by aspiration of the cyst, and it was realized that this is not necessarily followed by the development of further cysts, and also that the tendency to cyst formation may disappear. It is suggested that, with simple precautions, conservative treatment by aspiration is an efficient and safe treatment for cystic disease of the breast.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Economy in Manpower in Hospitals.—The Ministry of Health has issued a memorandum stressing the need for economy in hospital administration costs and asks boards and committees to review their staffs and achieve reductions wherever possible. It also requires them to obtain approval before increasing the total number of staff members employed. The largest single item in hospital budgets is expenditure on the salaries and wages of staff, and, in an effort to prevent the annual cost of the National Health Service from exceeding the ceiling figure of 1,120 million dollars each year, the first attack on the individual items of expenditure is made on the staff. Speaking in the House of Commons, Miss Hornsby-Smith, under-secretary to the Ministry of Health, said that it was essential that progress should be made, in view of the disparity between the staffing of hospitals. It was aimed to get the staff where they were most needed. Recently there had been remarkable successes in reorganization of duties, in installation of more equipment and labor saving devices, and in discontinuance of unessential work.

This memorandum did not propose any target for the reduction of any medical or nursing staffs, nor did it impose control over individual appointments. Vacancies would be filled as an ordinary matter of routine. But increases in total number of staff members had to be justified. When one realized that 65% of the 630 million dollars spent on the hospital services alone were used for salaries and wages of hospital staffs, it was absurd to think of any review of the finance of the National Health Service if this vast field of expenditure was to be ignored. As far as manpower was concerned, in 1951 there were 15% more full-time staff members and 33% more part-time staff members than in 1948. The Ministry must be satisfied that there was no waste of national manpower.

Figuring Radiological Work in Units.—Circular 94121/1/14, issued by the Ministry of Health on Dec. 23, 1952, begins as follows: "This memorandum sets out a new method of recording the work undertaken in diagnostic X-ray departments, which will come into use on 1st January, 1953." Many radiologists take strong objection to this, because again the Ministry of Health appears not to have sought cooperation and agreement with the profession. Three years ago the Nuffield Provincial Hospitals Trust looked into methods of estimating the work done in hospital radiodiagnostic departments. A subcommittee of the British Medical Association's Radiologists Group Committee joined with the trust in this inquiry, and it was decided to try out in 1952 the "unit" system, which is the subject of the Ministry of Health edict. It was arranged that at the end of 1952 the Radiologists Group Committee should receive a report on how the system had worked, so that it could consider its worth and possible modifications. Instead, this circular was distributed on the unit system of estimating work done in diagnostic roentgenographic departments. Apparently the Ministry had taken this scheme from the Nuffield Trust, which had had it from the Radiologists Group Committee, and went into print with it without any consultation with the B. M. A. or its group committee. Quoting from a recent leading article on the Ministry's unilaterality, "This is an excellent example of how not to do things." Those responsible for the work of diagnostic roentgenographic departments will have every justification in refusing to obey the instruction in the circular.

In regard to the system itself, one unit is given for "gall-bladder, Plain," 2 units for "urinary tract, plain," or 8 units for "Smith Petersen pin, insertion of and similar procedures." At the end of the year the units will be added up, and then calculated in terms of radiologists and their technical assistants, no doubt also in units. Apparently the system, in its trial period, has worked satisfactorily in some hospitals. But the criticisms against it by Dr. J. W. Bull have great validity, and he speaks with the authority of the man doing the job. There is, he points out, all the difference between roentgenographing the spine of a slim adult and that of an obese, incontinent, and paraplegic patient lying in plaster. The time taken for a ventriculography (10 units) may vary from 10 minutes to two hours. In short, human beings just will not fit into a ministerial sliding scale. And in the background to all this there is an element of distrust; it seems that the Ministry cannot trust hospital staffs to do their work with a sense of responsibility, and not to ask for more staff than is necessary. If medical men are instructed by the Ministry that roentgenographing "spine, more than one area" is worth only four units of work, there is a suggestion that, following the example of the bricklayer, they will end up by laying down their tools on the completion of the fourth unit. Is this really medicine in Britain today? It is to be hoped that the Ministry of Health will have second thoughts.

Lord Horder and the Health Service.—In a series of three Harben lectures at the Royal Institute of Public Health and Hygiene, Lord Horder has spoken critically of the National Health Service. In its creation two fundamental errors have been made. One was its overnight introduction, and the other was the attempt to do too much in too short a time. The medical profession had pleaded for progress by evolution, but in vain. Had the service been introduced in two steps and a reasonable pause allowed for consolidation, many of the defects of the present scheme might have been avoided. The first step should have been the regionalization of the hospitals, with grants-in-aid administered locally, and the second the addition of workers' dependents to the national health insurance service that had been in operation since 1911. The new service was based primarily on the hospital and not on the family physician. This was the negation of adequate medical care, which was an integration of the family physician, the hospital, and the consultant. Such an integration to be effective could be attained only by development within the profession; it could not be dictated by the state. The general practitioner was finding his time increasingly taken up with other problems. Even after four years of the service, health centers were almost nonexistent, and there was less postgraduate instruction. More serious still was the fact that the relationship between physician and patient, which was the essential of successful medical care, was grossly interrupted. The government had been unable to do anything about the fantastic disparity between budget and expenditure, and the National Health Service was becoming financially insecure.

Lord Horder was equally outspoken in his criticism of social medicine as a specialty. "Humanist though I am, and wholehearted supporter of the thesis that medicine should be made 100 per cent available to the people, I have never been quite convinced that the notion underlying the new branch of it which has been called 'social medicine' has justified itself." The claims made for social medicine seem to fall well within the orbit of general medicine. The importance of knowing all about the patient's social, domestic, and employment background had always been recognized by sound clinicians, but to make such inquiries a special branch of medicine seemed redundant.

NORWAY

Treatment of Speech Defects.—The Granhaug School for combating defects of speech was founded in 1919 by Hans Eng, who remained its director till his death in 1939. It is a boarding school with accommodation for 21 pupils and a few day boarders. The age limit for pupils is 7 to 25 years, and the demand for admission has exceeded the supply to such an extent that applicants have had to wait five to six years. It was therefore obvious that this national school must be enlarged, and in 1946 a site was acquired by the state for the erection of a new school. Temporary quarters have meanwhile been provided for some 30 pupils, and in the autumn of 1952 a boarding house was acquired for the accommodation of 36 pupils classified in three age groups. Some 100 pupils can now be accommodated by this school every year for courses of training lasting several months. Meanwhile the original Granhaug School continues to deal with speech defects associated with cleft palate, general disturbances of speech, deaf-mutism, delayed development of speech, word blindness, and functional disturbances of speech. Attached to the school are specialists in plastic surgery, dentists, and ear, nose, and throat specialists. Approximately half of the pupils

suffer from defects of speech due to cleft palate, and most of them require at least a year's training, in some cases up to two years.

In such a vast and thinly populated country as Norway the treatment of speech defects cannot be limited to a few central schools and it would be absurd to send a lisping child from the North to the South of Norway for treatment. Schools like Granhaug must therefore be devoted to more serious cases, cleft-palate cases for example, while an elastic system must be devised for local or ambulatory treatment. In recognition of this principle a state-controlled scheme was devised in 1946 for the training of speech pedagogues or logopeds. Norway is one of the few countries in the world with a team of fully trained logopeds who must present evidence of a comparatively high scholastic attainment in order to qualify for training as a logoped. The one year training period is carried out partly at the Granhaug School and partly at the University of Oslo. Ultimately a training of two years will be necessary. More than two score logopeds have already been trained, and nearly all of them also hold certificates as school teachers. Ultimately every administrative district in Norway will have its own logoped trained to distinguish between the various defects of speech, to give treatment in suitable cases, or to recommend the patient for treatment in a special school. He will be able to help adults who because of laryngectomy or some other handicap have to train themselves again to speak, and who have hitherto been much at the mercy of amateurs at home or have had to go abroad for help. Norwegian logopeds have already formed their own professional body known as the Norwegian Logoped Association to promote the welfare of its members and the patients in their care. The address of this body is: Postboks 210, Lysaker, Norway.

BCG Studies.—At the Glittre Sanatorium, under the charge of Dr. Rolv Høyer Dahl, there are already ample opportunities for studying the behavior of pulmonary tuberculosis in persons previously vaccinated with BCG, for BCG vaccination has been in force in Norway for many years. Between Jan. 1, 1948, and April 1, 1952, 64 of the patients resident in this sanatorium had been vaccinated with BCG. All the 64, who constituted approximately 5% of all the patients treated during this period, were adults, the oldest being nearly 50 years old. The disease was of the destructive type in 52 of these cases and of the nondestructive type in 12. Most of the patients had been vaccinated between the ages of 15 and 30 several years before admission to the sanatorium. Among the 64 were 6 nurses, who had been exposed to infection after vaccination and had been kept under close tuberculin supervision.

In his comments on these cases in the organ of the Norwegian Medical Association, *Tidsskrift for den norske laegeforening* (**1**:10 [Jan. 1] 1953), Dr. Sigmund Bøyum draws special attention to the patients who had remained tuberculin-negative after several BCG vaccinations. Failure to respond to BCG with a positive tuberculin reaction is, in his opinion, by no means a sign indicative of good resistance to the tubercle bacillus, as is believed in certain quarters. Nearly all the patients who had remained tuberculin-negative after BCG vaccination and in whom pulmonary tuberculosis subsequently developed belonged to families in which there was much tuberculosis. It seems to Dr. Bøyum that successive BCG vaccinations at short intervals may defeat their object, for a faint response on the first occasion, with an infiltration of only 1 or 2 mm., may block the spread of BCG in the organism when vaccination is repeated after a short interval.

Another BCG study comes from the central BCG laboratory in Bergen under the charge of Dr. J. Bøe. He is concerned over the deterioration of BCG under the influence of sunlight, a problem now being investigated in many BCG laboratories. While some authorities believe that variations in the potency of BCG depend chiefly on the influence of sunlight, Dr. Bøe does not go so far, and he believes that the potency of different samples of BCG will continue to vary, however effective the precautions taken against sunlight may be. He does not follow the example of the Danish and Swedish BCG laboratories, which now send out BCG in ampuls colored red on the assumption that red light is the least harmful to BCG. But in recent months he has enclosed in each consignment of BCG a short notice to the effect that it should be kept in the dark and preferably cool. The vaccine must not be left to stand in the window nor in a syringe for any length of time.

Death of Prof. Johan Holst.—The death of Prof. Johan Holst early in 1953 came as a great surprise to his many friends, since this alert, athletic, 60-year-old surgeon passed away only a week or two after he had been at work. He came of medical stock, and his father, Peter F. Holst, was professor of medicine at the University of Oslo. Quite early in his career, Johan Holst undertook special studies of the diseases of the thyroid gland, and it was his investigation of the pathogenesis of Graves' disease that earned him the degree of doctor of medicine in 1924. Thereafter his activities were, for the most part, surgical, and his surgery of the thorax, with special reference to pulmonary tuberculosis, earned him an international reputation. He was only 38 years old when appointed professor of surgery at the University of Oslo and was put in charge of the surgical department A of the Rikshospital. His wartime activities date as far back as to 1918, when as a young physician he took part in Finland's Liberation War. When Finland was again at war in 1939, Holst organized the Norwegian Ambulance Service sent to Finland. When war broke out in Norway in 1940, Holst was at once put in charge of the Norwegian Army Medical Service, and he remained at the head of it till the end of the war. He escaped from Norway during the war under dramatic circumstances and thenceforth worked abroad with the Norwegian forces serving in England and elsewhere. The honorary degree conferred on him by the University of Glasgow was one of the many tokens of the high esteem in which he was held abroad as well as at home.

SWITZERLAND

Medical Insurance.—On Dec. 31, 1950, in Switzerland 3,083,108 persons were insured by a recognized sick fund. Included were 1,267,792 men, 1,179,970 women, and 635,346 children. This represented 65.6% of the total population of the country and an increase of 1.1% (89,537 persons) compared with 1949. In certain cantons, where the insurance is obligatory, there are 85 to 99% of persons insured. In the cantons where the insurance is not obligatory, there are 36 to 48% insured persons. Most of the insured persons benefit from the provisions for medical and pharmaceutical expenses only, or in combination with a daily indemnity. In 1949 the receipts of the recognized sick funds involved 261 million francs, which were distributed as follows: contribution of the members 205 million, payment of the public powers 38 million and contributions of the employers 5,800,000 francs. The federal subsidies reached about 28 million francs, including subsidies to the tuberculosis insurance. The expenses reached 246 million francs and were broken down as follows: daily indemnities 58 million, medical and pharmaceutical expenses 142 million; accouchement 9 million; administration expenses 24,500,000; and indemnity at death 1,224,000.

Control of Tuberculosis.—In 1902 the central commission for the control of tuberculosis was created in Switzerland. This commission developed the idea of constructing the first popular sanatoriums. Chiefly under the presidency of Dr. E. Bachmann, from 1924 to 1948, the Swiss Association for the Control of Tuberculosis endeavored to prepare federal legislation on tuberculosis; it became the connecting link between the confederation and the cantons, and it accomplished much to the satisfaction of everybody. Recently, the association celebrated its 50th anniversary, in the presence of civil and medical authorities. The minister of public health, Mr. Etter, declared that 50 years ago 15% of the total number of deaths was attributed to tuberculosis, while in 1950 this had been reduced to 3.5%. Prof. E. Bernard, from Paris, general secretary of the International Union Against Tuberculosis, spoke in praise of this fight against tuberculosis, especially the creation of sanatoriums and preventoriums.

CORRESPONDENCE

HEPARIN AND ANGINA PECTORIS

To the Editor:—Dr. Hyman Engelberg discussed our article on heparin and angina and made several statements that require amplification (*J. A. M. A.* **152:**474 [May 30] 1953). His statement that "nearly all" of our patients had had angina for five years is inaccurate. In our article, we stated that this was true of the "majority" (over 50%). His statement that angina of this duration would be associated with "probably markedly calcific vessels" must remain a surmise, in the absence of anatomic confirmation. We are surprised that he considers angina of this duration a disqualifying feature, since he reported on 27 patients (*Am. J. M. Sc.* **224:**487, 1952), 12 of whom had had angina for four or more years. He reported improvement with heparin in 7 (58%) of these 12 patients and in 10 (66%) of the remaining 15 patients. The difference has no statistical validity and does not support the concept that this duration of angina is a critical factor.

Dr. Engelberg makes the unqualified generalization that domiciliary patients are resistant to therapy because their security is threatened by any considerable improvement in symptoms. This has no basis in fact and is contrary to our personal experience with the medical program for domiciliary patients at this center. It ignores the fact that 22 (65%) of our 34 patients improved with intravenous therapy (heparin and sodium chloride solution placebo). This is almost identical to Dr. Engelberg's report of improvement, with heparin, in 17 (63%) of 27 patients. Dr. Engelberg attributes this improvement solely to heparin, while we, utilizing the double blind control, found that sodium chloride solution placebos were equally as effective as heparin. Dr. Engelberg suggests that heparin has a gradual delayed response and a prolonged carry-over when used in the treatment of angina pectoris. This theory, to our knowledge, has not been confirmed by any other investigator. It is not in accord with the original findings of Graham and co-workers (*Circulation* **4:**666, 1951), who first reported beneficial effects of heparin in angina. They found that heparin produced relief of angina soon after heparin therapy was begun, usually after the first few injections, and that relief persisted for several days after a single injection. All of seven patients whose severe angina had been relieved by heparin injections complained of return of anginal symptoms when sodium chloride solution placebos were injected instead of heparin.

It is of interest that five other groups of investigators found, as we did, that heparin has no significant effect on the symptomatic relief of angina (Russek, Urbach, and Doerner and Miller, Zinn, and Griffith in 1952 and Grüner and co-workers, Rinzler and co-workers, and Port and co-workers in 1953). Heparin therapy was given for 6 weeks by Miller, Zinn, and Griffith, for 7 to 11 weeks by Grüner and co-workers, for 8 to 11 weeks by Rinzler and co-workers, and for two separate 10 week periods by Port and co-workers. In each instance, placebo therapy was given for about the same length of time as heparin therapy. None of the investigators detected a gradual response to heparin or a prolonged carry-over. We agree with Dr. Engelberg that "conscious and unconscious emotional factors" are extremely important in evaluating the response of angina to any drug. For this reason, we advocate the use of the double blind method so that enthusiasm or lack of it, on the part of the physician as well as the patient, will be properly controlled.

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CHEMICALLY TREATED FLOUR

To the Editor:—In The Journal (**152:**353 [May 23] 1953), there was a note concerning the report of a case in the *Lancet* (**1:**577, 1953) in which eczema, mental depression, and anorexia "associated with the ingestion of chemically treated flour" developed. The authors concluded, after presenting their findings, that the patient showed an allergic response to wheat flour treated with nitrogen trichloride or chlorine dioxide. In addition, they asked whether "this is a rare case of allergy or merely the first recognition of a common disorder." In 1949, I published a paper on the "Species Specificity of Agene Toxicity" in the *Journal of Applied Physiology* (p. 802) and reported that the ingestion over a period of time of over one half of the initial body weight of bread and cookies made with wheat flour that had been very heavily treated with nitrogen trichloride (Agene) had no ill effect on three patients with epilepsy. No demonstrable changes could be detected in the electroencephalogram, various blood, urinary, and spinal fluid biochemical determinations, and psychological, psychiatric, nutritional, or neurological status. The patients gained much weight and were very happy in the hospital. No skin disorders were observed. These same patients were fed a control diet before and after the experimental diet; the control diet was identical to the experimental diet except that it included unbleached flour. Several months after the experiment, the patients expressed a desire for the "cookies" they had previously been fed. Other investigators have also reported no demonstrable toxic effects from the ingestion of flour treated with nitrogen trichloride. In my experiments, identical control and experimental flour was tested on dogs, cats, and monkeys. It was found that after one feeding of the experimental diet severe signs of toxicity developed in the dogs within 18 hours, (tremors, convulsions, and typical electroencephalogram records). If allowed to feed again, they died in status epilepticus within 24 hours. This discrepancy in toxicity has been explained recently by Reiner and his co-workers. Apparently the nitrogen trichloride acts on the amino acid methionine found in wheat flour to produce methionine sulfoximine. This substance, when accumulated, produces toxic symptoms. It is not readily excreted via the kidney in dogs, but man has no difficulty in eliminating it. This explains the difference in species response. On the basis of these facts, I feel the report by the British authors is not one of a new syndrome but one of a rare allergy. I want to indicate, however, that my experiments were limited in that only flour treated with nitrogen trichloride was used.

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UNUSUAL VIRUS FROM POLIOMYELITIC SPINAL CORD

To the Editor:—We have recently isolated, from the spinal cord of a child with typical clinical and histological poliomyelitis, a filterable agent (Kentucky virus) that is not related immunologically to the three standard types of poliomyelitis. Human immune globulin neutralizes Kentucky virus in high titer. To date, all positive results with this virus have been achieved only in tissue culture. The Kentucky virus was obtained from the spinal cord of a child 18 days after onset of illness, a time at which the recovery of poliomyelitis virus is difficult because of the very small amounts of virus then present. The thalamus of each of two monkeys was inoculated with the human spinal cord suspension; both animals remained well and free of lesions. The virus was probably present in very low titer since only one of three attempts yielded the

agent producing cytopathology. After passage in vitro, the titer of the virus, revealed by fibroblastic degeneration, is 10^{-3} to 10^{-4}; it is destroyed in 30 minutes at 56 C, is ether resistant, and has not affected suckling or adult mice, guinea pigs, hamsters, or three monkeys.

Although one virus type usually dominates during a poliomyelitis epidemic, the other types have been found at the same time in other patients. In the 1952 Louisville poliomyelitis epidemic during which the Kentucky virus was isolated, the attack rate was 149 per 100,000 persons and the poliomyelitis virus strain recovered was type 1. One possible although not solitary explanation for the presence of Kentucky virus in the spinal cord of a patient who died of poliomyelitis is a causal rather than a casual relationship. If other laboratories recover immunologically related viruses from the spinal cord of poliomyelitis patients, the existence in humans of a hitherto unrecognized immunologic type of poliomyelitis virus important in epidemics and in active immunization against the disease would require assessment. We believe it advisable to make these findings known at this time so that full opportunity is taken in the ensuing poliomyelitis season to inspect spinal cord material from persons who die of the disease.

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LUMBAR SYMPATHETIC BLOCKS AND ANTICOAGULANT THERAPY

To the Editor:—In The Journal (May 30, 1953) there was an article entitled "Danger of Lumbar Sympathetic Blocks During Anticoagulant Therapy" by Robert P. Hohf, William S. Dye, and Ormand C. Julian. The authors reported retroperitoneal hemorrhage following paravertebral lumbar sympathetic block during anticoagulant therapy in three patients with peripheral vasospasm. In their comment they state, "It is apparent that there is no way to avoid this catastrophe by modifying the technique by which a block is performed or by regulating the therapeutic dose of anticoagulants." It has been shown that adequate lumbar sympathetic block may be obtained by the injection of dilute solutions of local anesthetics into the epidural space (Ruben, J. E.: *Anesth. & Analg.* **29:**296, 1950). This space may be entered for the purpose by the caudal or the interspinous route. A flexible needle (Hingson, R. A., and Southworth, J. L.: *Mil. Surgeon* **100:**474, 1947) or a plastic or nylon catheter (Ruben, J. E.: *Ann. Surg.* **131:** 194, 1950) may be placed in the epidural space through the sacral hiatus for continuous lumbar sympathetic block by this method. The arrangement for continuous block prior to the induction of anticoagulant therapy has proved perfectly safe and very satisfactory for more than five years. The benefit of lumbar sympathetic block need not be denied the patient with vasospasm who is receiving anticoagulants.

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SURGEON'S HELPER

To the Editor:—Any instrument, particularly a simple and inexpensive one, that aids or expedites a surgical procedure is worthy of note. The surgeon's helper is such an instrument; it might even be called a seeker. This little instrument contains a powerful patented magnet not so large as a conventional needle holder. It is entirely self-contained and has no batteries or connections. It withstands repeated boiling and autoclaving without apparent loss of magnetic power. The instrument consists of a simple cartridge measuring 7 mm. by 6 cm. with the magnetic button on one end. A milled handle 15 cm. long is hinged to the cartridge to permit the greatest flexibility in gaining access to remote places. The milled handle also provides a good grip.

The surgeon's helper has a broad scope of usefulness. When looking for a broken needle, a needle eye, metal clips, or small pieces of steel wire, all one must do is pass the magnet through the surgical field or drapes; the instrument immediately picks up the metal objects. It saves a great deal of time and patience particularly when one is looking for broken needles. This little magnet may be purchased at any automotive supply store for less than a dollar. It is also available in larger sizes.

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SNAKE VENOM POISONING

To the Editor:—In their article "Treatment of Snake Venom Poisoning with Cortisone and Corticotropin" (*J. A. M. A.* **152:**236 [May 16] 1953), Hoback and Green reported that in two cases the bite was from a "copperhead moccasin." To avoid confusion, I believe this should be clarified. The snake involved undoubtedly was either a copperhead (Agkistrodon mokasen) or a water moccasin (Agkistrodon piscivorus). To my knowledge there is no such creature as a "copperhead moccasin." Both the moccasin (water or cottonmouth) and copperhead belong to the family Viperidae (pit vipers).

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EFOCAINE

To the Editor:—Many favorable and a few unfavorable reports regarding the use of Efocaine in nerve block anesthesia have been published. Efocaine is a solution containing 1% procaine, 0.25% procaine hydrochloride, and 5% butyl-*p*-aminobenzoate in a solvent composed of 2% polyethylene glycol-300, 78% propylene glycol, and water. We wish to state that, although recent reports by ourselves and others have been favorable regarding the use of Efocaine for long-lasting local anesthesia, late postoperative examination of patients who have received nerve block shows a not infrequent incidence of pain at the site of injection and, occasionally, in the nerve distribution. Because of these complications, we have discontinued the use of Efocaine because we believe that, in its present form, it is an unsatisfactory medicament for this purpose.

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MILKER'S NODULES

To the Editor:—I noted with interest the editorial on milker's nodules in the May 2, 1953, issue of The Journal. While there have been very few cases in the country, there was at least one in New England. I discussed that case and showed a very good photograph of the nodules when I presented a paper, "Criteria for Diagnosis of Occupational Skin Diseases," in Ohio. The paper was published later (*Ohio State M. J.* **36:**937 [Sept.] 1940). I think it was excellent that the disease was described in an editorial, because I imagine that more cases have been seen than have been reported in the literature.

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MEDICAL MOTION PICTURES

Subtotal Gastrectomy for Duodenal Ulcer Perforating into the Pancreas: 16 mm., color, sound, showing time 29 minutes. Prepared by Joel W. Baker, M.D., the Mason Clinic, Seattle. Produced in 1951 by and procurable on loan from Davis & Geck, Inc., 57 Willoughby St., Brooklyn 1.

The author has illustrated his technique of doing a subtotal gastrectomy for perforated ulcer of the duodenum without removing the ulcer. He has demonstrated a posterior Hofmeister-Polya type of resection. He isolated the duodenum first and cut across the duodenum, leaving the ulcer, which had perforated into the pancreas. The duodenal stump was closed with interrupted nonabsorbable surgical sutures and the stump covered with omentum. Before incising the intestine, the author made an opening in the mesocolon. The gastrocolic and gastrohepatic omentum were then ligated and clamps applied for removal of the stomach after the Hofmeister technique. The anastomosis between the stomach and the jejunum is done with interrupted absorbable surgical sutures on the inside and interrupted nonabsorbable surgical sutures on the outside. A very short loop of proximal jejunum is left, measuring not more than 2 in. The author removes at least three-fourths of the stomach. Aseptic technique is carried out carefully. The author states that whenever possible he prefers to remove the ulcer, but in 70 of 270 cases with duodenal ulcer he has left the ulcer in situ, performing an operation as illustrated. He reports no leaks of the duodenal stump and no mortality in these 70 cases. At the end of the operation the peritoneal cavity was irrigated with saline, a procedure that might be criticized by some surgeons as possibly spreading contaminated material. The surgical technique demonstrated is good, and proper precautions are taken throughout the operation. The photography is excellent. This film is recommended for young surgeons, including residents.

Regional Analgesia: 16 mm., color, sound, showing time 34 minutes. Prepared by Daniel C. Moore, M.D., Seattle, and John J. Bonica, M.D., Tacoma, Wash. Produced in 1952 by Rarig Productions, Seattle. Procurable through representatives of Winthrop-Stearns Inc., 1450 Broadway, New York 18.

This film demonstrates the authors' technique for regional anesthesia pertaining to blockade of the stellate ganglion, lumbar sympathetic chain, brachial plexus, and sciatic and femoral nerves, utilizing tetracaine (Pontocaine) hydrochloride solution. Anatomic review of each block is well demonstrated by means of unusually clear drawings, animation, discussion, and demonstration on the live subject. Discussion includes indications, procedure, effects and extent of analgesia, and complications. It is felt that aseptic preparation of the field should be stressed and demonstrated in its proper sequence. At one point in the film, the gloved hand was seen to touch an obviously unprepared area and then to return to the operative field. Listing of complications is an excellent teaching aspect of the film, but no visible evidence was presented during the procedures that equipment for treating such complications was actually ready and available. The animation and captions are clear and complete, the narration is clear and concise, and the photography and drawings are excellent. This film is recommended for surgeons, anesthesiologists, neurologists, and medical students.

NEW FILM ADDED TO A. M. A. MOTION PICTURE LIBARY

Blood Streams in the Basilar Artery: 16 mm., color, silent, showing time 9 minutes. Demonstrated by D. A. McDonald and J. M. Potter, Department of Physiology, St. Bartholomew's Hospital Medical College, London. Produced by the Wellcome Film Unit, London, in 1949 and sponsored by Burroughs Wellcome & Co. (Wellcome Foundation), London. Procurable on loan (service charge $1.00) from Committee on Medical Motion Pictures, American Medical Association, 535 N. Dearborn St., Chicago 10.

This short, concise film shows in strikng form the manner in which blood flows through the basilar artery of a rabbit, as revealed by the injection of a dye with and without experimental interruption of the flow. The special situation treated is that in which two arteries of equal size (right and left vertebral arteries) unite to form a single medium artery (the basilar). The anatomic situation is made clear by excellent diagrams in color, followed by brief sequences showing the dissection, cannulation, and other preparations. Because of the fortunate choice of experimental animal, the transparency of the artery permits one to see the rapid movement of the colored fluid, the separateness of streams from the right and left vertebral arteries, and the reversals of direction resulting from occlusion of one artery. The dissection shown is too difficult as a routine procedure in most physiology courses. In this film, it is so deftly done and so well shown that it affords students an opportunity to see things that they would probably never otherwise observe. The color photography is excellent. This and several other circumstances combine to give an appreciation of depth, which is helpful, and the film should be of considerable teaching value for medical classes in physiology.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

ADDITIONAL HOSPITALS REGISTERED

The following hospitals were registered by the Council on Medical Education and Hospitals of the American Medical Association at its meeting in New York City, May 29, 1953:

Clay County Hospital, Ashland, Ala.
Austin Lewis General Hospital, Birmingham, Ala.
Veterans Admin. Hospital, Birmingham, Ala.
Blount Memorial Hospital, Oneonta, Ala.
Lee County Hospital, Opelika, Ala.
Hoemako Cooperative Hospital, Casa Grande, Ariz.
Gurdon Municipal Hospital, Gurdon, Ark.
Springdale Memorial Hospital, Springdale, Ark.
Levine Hospital, Hayward, Calif.
Modesto City Hospital, Modesto, Calif.
Hoag Memorial Hospital—Presbyterian, Newport Beach, Calif.
U. S. Air Force Hospital, Parks Air Force Base, Calif.
Mercy Hospital, Redding, Calif.
Roseville District Hospital, Roseville, Calif.
Golden Hill Hospital, San Diego, Calif.
Veterans Admin. Hospital, West Haven, Conn.
St. Joseph's Hospital, Augusta, Ga.
Rockmart-Aragon Hospital, Rockmart, Ga.
Screven County Hospital, Sylvania, Ga.
Lake Shore Convalescent Home, Chicago, Ill.
Allen County Hospital, Iola, Kan.
Community Memorial Hospital, Virgie, Ky.
Southeast Louisiana Hospital, Mandeville, La.
Bangor City Hospital, Bangor, Maine
Joseph P. Kennedy Jr., Memorial Hosp., Boston, Mass.
Holyoke Soldiers' Home and Hospital, Holyoke, Mass.
Oakwood Hospital, Dearborn, Mich.
Sinai Hospital, Detroit, Mich.
Community Hospital, Browns Valley, Minn.
Mesaba Clinic Hospital, Chisholm, Minn.
Washington County General Hospital, Greenville, Miss.
Daniels Memorial Hospital, Scobey, Mont.
Hord Memorial Hospital, Central City, Neb.
Crotched Mountain Rehabilitation Center, Greenfield, N. H.
Eunice Hospital, Eunice, N. Mex.
U. S. Air Force Hospital, Geneva, N. Y.
Liberty-Loomis Hospital, Liberty, N. Y.
Riverside Hospital, New York, N. Y.
Veterans Admin. Hospital, Durham, N. C.
Moses H. Cone Memorial Hospital, Greensboro, N. C.
Stanley Community Hospital, Stanley, N. D.
Adams County Hospital, West Union, Ohio
Stilwell Municipal Hospital, Stilwell, Okla.
Fairlawn Hospital, Portland, Ore.
Hillcrest Hospital, Portland, Ore.
Doylestown Emergency Hospital, Doylestown, Pa.
North Hills Sanatorium, Glenside, Pa.
Meyersdale Community Hospital, Meyersdale, Pa.
Deuel County Memorial Hospital, Clear Lake, S. D.
Freeman Community Hospital, Freeman, S. D.
Gettysburg Memorial Hospital, Gettysburg, S. D.
Bradley County Memorial Hospital, Cleveland, Tenn.
Unicoi County Memorial Hospital, Erwin, Tenn.
Anson General Hospital, Anson, Texas
Medical and Surgical Clinic Hosp., Fort Worth, Texas
Burow and McRoberts Clinic and Hosp., Killeen, Texas
Max Mixson Memorial Clinic Hosp., Kirbyville, Texas
Galveston County Memorial Hospital, La Marque, Texas
Plainview Medical Center, Plainview, Texas
Rockwall Medical Clinic-Hosp., Rockwall, Texas
Surgical and Obstetrical Hospital, San Antonio, Texas
San Juan Maternity Hospital, San Juan, Texas
Battenfield Hospital Clinic, Snyder, Texas
Holton-Johnston Hospital, Terrell, Texas
Patterson Memorial Hospital, Troup, Texas
Utah Permanente Hospital, Dragerton, Utah
City-County Hospital, Price, Utah
Lutheran Minor Hosp. for Chronic Disease, Puyallup, Wash.
Eye and Ear Hospital, Wenatchee, Wash.
Memorial Hospital, Boscobel, Wis.
Hudson Memorial Hospital, Hudson, Wis.
Community Memorial Hospital, Oconto Falls, Wis.
Niobrara Memorial Hospital, Lusk, Wyo.

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Neurology and Psychiatry, Chicago

69:281-414 (March) 1953

Blood Plasma in Multiple Sclerosis: Periodic Abnormalities in Pattern of Paper Chromatograms. R. L. Swank.—p. 281.
Effect of Prefrontal Lobotomy on Intellectual Functioning in Chronic Schizophrenia. P. B. A. Struckett.—p. 293.
Agenesis of Corpus Callosum Diagnosed During Life: Review of Literature and Presentation of Two Cases. M. B. Carpenter and W. H. Druckemiller.—p 305.
Test of "The Abstract Attitude" in Chimpanzees Following Ablation of Prefrontal Cortex. E. V. Evarts and H. W. Nissen.—p. 323.
Poliomyelitis: VIII. Studies on Temperature Regulation. I. A. Brown, A. B. Baker and S. Cornwell.—p. 332.
Subarachnoid Injection of Alcohol in Treatment of Spasticity in Paraplegia. S. Stellar.—p. 343.
Relation of Social Attainment to Psychological and Adrenocortical Reactions to Stress. D. L. Gerard and L. Phillips.—p. 350.
Personality Factors in Denial of Illness. E. A. Weinstein and R. L. Kahn. —p. 355.
Adrenocortical Responsitivity to Electric Shock Therapy and Insulin Therapy: Study of 56 Mentally Ill Patients in Rockland State Hospital, Orangeburg, N. Y. S. P. Alexander and J. F. Neander.—p. 368.
Tic Douloureux of Chorda Tympani: Report of Cases. S. Rosen.—p. 375.

A.M.A. Arch. Otolaryngology, Chicago

57:245-370 (March) 1953

Modified Radical Mastoidectomy: Indications and Results. A. L. Juers. —p. 245.
*Surgery of Sympathetic for Ménière's Disease, Tinnitus, and Nerve Deafness. E. R. G. Passe.—p. 257.
Importance of Hyperplastic Sinusitis in Etiology of Allergic Rhinitis. R. C. Grove.—p. 267.
Lye Burns of Esophagus. Wen-Chih Hung, Shih-Hsiung Huang and Chin-Te Lai.—p. 282.
Deafness in Shipyard Workers: Critical Evaluation of Findings in 600 Cases and Diagnosis of Occupational Deafness. A. I. Goldner.—p. 287.
External Otitis. H. E. Branca.—p. 310.
Extralaryngeal Approach to Arytenoidectomy in Bilateral Paralysis of Abductors of Larynx. M. Ćurković and M. Horvatsky.—p. 328.

Sympathectomy for Ménière's Disease, Tinnitus, and Nerve Deafness.—According to Passe, neurovascular disturbances, the result of an underlying autonomic imbalance, could be the etiological factor in a large number of cases of Ménière's disease, tinnitus, and nerve deafness. It was this concept that prompted the author to use sympathectomy as an approach to the treatment of these conditions. Stellate ganglion block with 1% procaine hydrochloride without epinephrine was used as a diagnostic test in the selection of cases. Those patients who before stellate ganglion block showed a disproportionate loss of perception of speech intelligibility compared with the pure-tone losses showed an equally disproportionate gain in speech discrimination compared with the pure-tone audiometric gain after stellate ganglion block. This preoperative finding has extreme diagnostic and prognostic significance. Of 91 patients with Ménière's disease, 45 were treated by removal of the stellate ganglion using the standard anterior approach but also stripping the vertebral artery and 46 were subjected to upper dorsal sympathectomy according to Smithwick's technique, with the modification that only the second and third ganglions were decentralized. In the group in which the stellate ganglion was resected, vertigo was completely relieved in 28 patients, improved in 16, and unchanged in 1; tinnitus was completely relieved in 11, reduced in 23, and unchanged in 11; hearing was improved in 32 with audiometric gains of 15 db. or more in 16, while it was unchanged in 13. In the group undergoing upper dorsal sympathectomy, vertigo was completely relieved in 28 patients and improved in 16, and results were not known in 2; tinnitus was completely relieved in 9, improved in 19 and unchanged in 16; hearing was improved in 38, with audiometric gains of 15 db. and over in 10, while it was unchanged in 6 and results were not known in 2. In relieving the tinnitus and improving the hearing, stellectomy appears to give slightly better results. Patients with stellectomy have been observed for five years and those with upper dorsal sympathectomy for two years. Seventy patients with tinnitus that had no local organic cause were also studied by means of procaine hydrochloride block; 30 were subjected to removal of the stellate ganglion and 40 to upper dorsal sympathectomy. In the first group, tinnitus was completely relieved in 5 patients and reduced in 10; it returned to preoperative levels in 15. In the second group, tinnitus was completely relieved in 6 patients, reduced in 21, and returned to preoperative levels in 9; 4 patients were lost to observation. Thus the operation has been a complete success in 17%, worth-while in 33%, and a failure in 50% of the stellectomies, but a complete success in 15%, worth-while in 50%, and a failure in 35% of the upper dorsal sympathectomies. Of 60 patients with "idiopathic perceptive deafness" selected according to their response to procaine hydrochloride block, 19 were subjected to removal of the stellate ganglion and 41 to upper dorsal sympathectomy. In the first group hearing was improved in 16 patients, with a gain of 10 db. or more in 13, and remained stationary in 3. In the second group hearing was improved in 32 patients, with a gain of 10 db. or more in 24, and remained stationary in 5; results were not known in 4. As a result of his experience the author states that at the present time sympathectomy does seem to be the ideal treatment in a large group of cases of Ménière's disease. The few patients with nerve deafness who respond to procaine hydrochloride block should have the sympathectomy, for in those the results are gratifying and there is no other treatment for this whole group.

American Journal of Medicine, New York

14:261-388 (March) 1953

Prolonged Treatment of Rheumatoid Arthritis with Cortisone and Corticotropin. M. H. Levin, J. B. Rivo, W. Scott and others.—p. 265.
*Effect of Cortisone and ACTH on Protracted Phase of Rheumatic Carditis in Children. L. M. Taran, G. A. Gulotta, N. Szilagyi and others. —p. 275.
Chloramphenicol and Terramycin in Treatment of Pneumonic Plague. F. R. McCrumb Jr., S. Mercier, J. Robic and others.—p. 284.
Blood Stream Invasion by Newcastle Disease Virus Associated with Hemolytic Anemia and Encephalopathy: Report of Three Cases. S. E. Moolten, E. Clark, B. F. Glasser and others.—p. 294.
*ACTH in Reiter's Syndrome: Four Cases, with Review of Literature. E. Larson and S. J. Zoeckler.—p. 307.
Pheochromocytoma: Its Relationship to Neurocutaneous Syndromes. A. S. Glushien, M. M. Mansuy and D. S. Littman.—p. 318.
Congenital Familial Testicular Deficiency. A. R. Sohval and L. J. Soffer. —p. 328.
Hemophilia. A. J. Quick.—p. 349.

Cortisone and Corticotropin in Protracted Rheumatic Carditis.—Cortisone and corticotropin were given to 16 children between the ages of 7 and 16 years with acute protracted rheumatic carditis. All of these patients had moderate to pronounced structural damage of the heart and had had active rheumatic fever for four months to four years before the institution of hormone therapy. The duration of treatment varied from patient to patient, depending on the extent of improvement or the onset of untoward effects. Ten of the 16 patients were treated with cortisone during the first four weeks in

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Titles marked with an asterisk (*) are abstracted.

doses of 200 to 300 mg. daily for three days; 150 mg. daily for the next three days; 100 mg. daily for 15 days; 75 mg. daily for two days; 50 mg. daily for two days; 25 mg. daily for two days; and 10 mg. for one day. This was followed by a three week interval of supportive therapy only. This period was followed by a course of corticotropin (ACTH) therapy in doses of 30 mg. twice daily for the first three days; 25 mg. twice daily for the next three days; 20 mg. twice daily for 15 days; 15 mg. twice daily for two days; 10 mg. twice daily for two days; 5 mg. twice daily for two days; and 5 mg. daily for one day. After an interval of three weeks, the regimen was repeated. Of the 16 patients, 7 showed mild improvement as manifested by an increase in appetite and a definite sense of well-being, although some of the rheumatic symptoms remained unchanged; 6 patients showed moderate clinical improvement, with pronounced increase in appetite, gain in weight, lowering of the temperature, and disappearance of all symptoms. Three patients showed dramatic improvement within 48 hours after the beginning of therapy; there was disappearance of all rheumatic symptoms, drop in pulse rate and temperature, fall in erythrocyte sedimentation rate, and pronounced euphoria. Clinical improvement thus was obtained in all patients, and exudative phenomena were readily suppressed during hormone therapy. All 16 patients continued to show clinical and laboratory evidence of rheumatic carditis when therapy was discontinued. None of the authors' patients showed regression in clinical evidence of endocarditis or cardiac hypertrophy. Many of the patients showed some untoward effects. Ten patients showed one or several signs of Cushing's syndrome. Nine patients showed definite evidence of psychological effects, euphoria, or depression. In three patients pronounced syncope occurred following parenteral administration of cortisone acetate. Whether this form of treatment significantly affects the course of rheumatic disease in long-standing cases remains to be proved. Further exploration in dosage schedule and method of administration may provide a more definite answer to this problem.

Corticotropin in Reiter's Syndrome.—The occurrence of Reiter's syndrome, a self-limited clinical triad composed of nonspecific urethritis, purulent conjunctivitis, and acute arthritis in four men between the ages of 24 and 43 is reported. Although no definite cause has been established, the pleuropneumonia-like organisms (L-organisms) that were cultivated from the urethra in one of the authors' four patients, as well as in many patients reported on by other workers, seem to bear a more than casual relationship to Reiter's syndrome. The classical triad was associated with weight loss and muscular atrophy in all four patients who were treated initially with bed rest, salicylates, and physiotherapy. The first patient received penicillin, streptomycin, aureomycin, and antihistamines, and typhoid-paratyphoid vaccine intravenously, the second penicillin, sulfadiazine, streptomycin, chloramphenicol (Chloromycetin) and oxytetracycline (Terramycin), the third oxytetracycline, and the fourth patient penicillin and streptomycin, which had no apparent effect on the course of the disease. All four demonstrated prompt and dramatic remissions during treatment with corticotropin (ACTH) in doses of 20 to 30 mg. every six hours, which permitted ambulation and vigorous physical therapy. In addition, a sense of increased well-being, increased appetite, and associated weight gain were noted. All patients showed at least temporary relapses following therapy, and two required additional treatment with corticotropin. The authors believe that the use of corticotropin contributed greatly to the prevention of joint contractures in these patients and to their ultimate excellent outcome. As a result of their experience in these four patients and of observations collected from the literature, the authors state that the shortening of illness and the prevention of debility and joint contractures are the primary objectives of treatment of this self-limited syndrome and may be accomplished by the use of a nutritious diet, vitamin supplements, and a vigorous physical therapy regimen. Corticotropin, as an adjuvant, has a definite place in the over-all management of Reiter's syndrome.

American Journal of Psychiatry, New York

109:641-720 (March) 1953

Some Recent Developments in Soviet Psychiatry. J. Wortis.—p. 641.
Evaluation of Intravenous Ether as Treatment for Psychiatric Patients. D. H. Funkenstein and L. W. Meade.—p. 650.
Group Approach to Inpatient Adolescents. K. Cameron.—p. 657.
Prefrontal Leucotomy for Attempted Prevention of Recurring Manic-Depressive Illnesses. G. H. Stevenson and A. McCausland.—p. 662.
Evaluation of Use of Tetraethylthiuram Disulfide in Treatment of 560 Cases of Alcohol Addiction. E. C. Hoff and C. E. McKeown.—p. 670.
What Happens to Alcoholics. F. Lemere.—p. 674.
Research Team Concept and Cultural Pattern of Science. J. H. Rohrer. —p. 677.
*Deterioration in Dementia Paralytica. V. A. Kral and H. Dörken Jr. —p. 684.
Special Psychiatric Problems of the Paraplegic: Report of Case of Attempted Suicide by Paraplegic. J. Petrus and A. B. Balaban.—p. 693.
Effect of Electroshock on "Normal" Person Under Recent Stress: An Experiment Elucidating Influence of Electroshock on Defensive Operations of Ego L. Alexander.—p. 696.
Differential Indications for Use of Glutamic Acid. E. D. Kane.—p. 699.
Sedation of Alcoholic Patients with Nonsedative Drugs: Preliminary Report. J. Thimann.—p. 701.

Deterioration in Dementia Paralytica.—Comparative serologic and psychological investigations were made in 52 institutionalized patients with dementia paralytica, because it is generally accepted that the spinal fluid provides a reliable lead in assessing the effectiveness of the treatment. In general, it was found that the treated patients with negative spinal fluid reactions showed a more pronounced deficit both of intelligence and of personality resources than those cases still in an active phase. There was evidence, on the one hand, that part of the impairment to psychological functioning is reversible when the disease process is arrested early in the psychotic stage and, on the other hand, that some of the patients may continue to deteriorate even though treatment has rendered their spinal fluid negative. These results seem to indicate that two pathogenetic factors have to be considered: one probably connected with the inflammatory component and responsible for the acute clinical picture and the pathological changes in the spinal fluid and relatively easily influenced by modern therapeutic methods; and another one, long acting, not easily or not at all influenced by therapy and responsible for the slowly progressing deterioration. There are reasons to believe that this second factor is a vascular one, as suggested by Merritt and co-workers.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

69:361-538 (March) 1953

Roentgen Interpretation of Vesiculograms. A. Pereira.—p. 361.
Pulmonary Embolism Does Not Necessarily Mean Pulmonary Infarction: Case Report. M. E. Woesner, G. A. Gardiner and W. L. Stilson. —p. 380.
Cinefluorographic Studies of Cardiovascular Disease. R. F. Rushmer, D. K. Crystal, R. A. Tidwell and J. A. Hendron.—p. 385.
Blastomycosis and Actinomycosis of Spine. G. J. Baylin and J. M. Wear. —p. 395.
Motion of Lumbar Spine: Roentgenologic Study. S. S. Tanz.—p. 399.
Roentgen Manifestations of Unrecognized Skeletal Trauma in Infants. F. N. Silverman.—p. 413.
Use of Urokon in Cerebral Angiography: Preliminary Report. H. H. Gass and S. D. Jacobson.—p. 428.
Intravenous Urography by Rapid Injection: Further Results with an Improved Method. L. J. Friedman, R. Friedenberg and L. Love. —p. 433.
Immediate Hysterectomy Following Irradiation for Carcinoma of Uterine Fundus: Preliminary Report. E. A. Addington and R. A. Betts.—p. 442.
Use of Cobalt 60 in Gamma-Ray Therapy. E. M. Japha.—p. 445.
Experience with Simple Radium Applicator for Higher Parametrial Dosage in Cancer of Cervix Uteri. V. Kahanpää.—p. 466.
Simplified Technique for Roentgenography of Immobilized Patients. R. S. Clayton and M. F. Llewellyn.—p. 473.

Delaware State Medical Journal, Wilmington

25:29-52 (Feb.) 1953

Place of Drugs in Treatment of Rheumatoid Arthritis. J. Lansbury.—p. 29.
Diagnosis and Treatment of Acute Pancreatitis. T. A. Johnson.—p. 34.
Prolapse of Uterus. G. A. Mazzanti.—p. 41.
Early Toxemias of Pregnancy. I. Slovin.—p. 48.

Florida Medical Association Journal, Jacksonville

39:629-702 (March) 1953

Experience with Peritoneoscopy in Duval County. F. G. King.—p. 643.
Intralaryngeal Artenoidectomy in Bilateral Abductor Paralysis of Vocal Cords. T. M. Edwards.—p. 647.
Intra-Abdominal Apoplexy: Report of Case. E. P. Preston, J. W. Snyder and R. L. Evans.—p. 652.
*Parathion Poisoning in Citrus Grove Operations in 1951. J. W. Williams, J. T. Griffiths Jr. and C. R. Stearns.—p. 655.

Parathion Poisoning in Citrus Grove Operations.—Between March 1 and Oct. 31, 1951, 28 cases of supposed parathion poisoning in men employed in the spraying of citrus fruit were reported to the Florida Citrus Experiment Station. Of these, 9 cases were confirmed as due to parathion poisoning by blood cholinesterase tests, 8 were probably due to parathion poisoning, and 11 were definitely not parathion poisoning. All but one of the nine authenticated cases were exposed to parathion spray for more than 10 days. The histories of 13 patients are presented. Those of the nine authenticated cases of parathion poisoning emphasize the extreme importance of regular blood examinations during parathion exposure and the necessity for immediately removing a man from exposure if the red blood cell cholinesterase values drop below 70% of normal. One case suggests that in order for cholinesterase tests to be valid diagnostic aids, they must be made immediately after the patient becomes ill, as in some cases the cholinesterase levels return to normal quickly. The four other case histories suggest that the use of alcoholic beverages by those exposed to parathion may precipitate or aggravate symptoms of poisoning.

Georgia Medical Association Journal, Atlanta

42:105-158 (March) 1953

Controversies, Facts and Detection of Preinvasive Carcinoma of Cervix Uteri. H. E. Nieburgs.—p. 124.
Congenital Adrenocortical Insufficiency. S. Smith and M. H. Roberts. —p. 127.
Practical Consideration of Thrombo-Embolism. S. M. Talmadge and D. F. Mullins Jr.—p. 133.
Further Efforts to Reduce Mortality in Peptic Ulcer Hemorrhage. C. S. Jones.—p. 136.
Relapsing Febrile Nodular Non-Suppurative Panniculitis (Weber-Christian's Disease): Report of Case with Autopsy Findings. J. E. Anthony Jr. and J. K. Davidson.—p. 138.

Journal of Investigative Dermatology, Baltimore

20:171-246 (March) 1953. **Partial Index**

In Vitro Studies on Fungistatic Effect of Antihistaminic Drugs. W. J. Fahlberg.—p. 171.
Some Endocrine Aspects of Skin Sensitization and Primary Irritation. III. Observations on Influence of Cold Exposure and Formalin Treatment (Systemic Stress) Upon Cutaneous Irritation and Sensitization. A. Nilzen.—p. 185.
Occurrence of Dermatophyte, Microsporum Gypseum, as a Saprophyte in Soil. M. A. Gordon.—p. 201.
Some Effects of ACTH, Cortisone, Progesterone and Testosterone on Sebaceous Glands in White Rat. D. Haskin, N. Lasher and S. Rothman.—p. 207.
Lichen Myxedematosus (Differentiation from Cutaneous Myxedemas or Mucoid States). H. Montgomery and L. J. Underwood.—p. 213.

Journal-Lancet, Minneapolis

73:41-82 (Feb.) 1953

Medicine in Great Britain: Some Personal Experiences and Observations. J. R. Fox.—p. 41.
Role of Anxiety in Physician-Patient Relationship. S. F. Brown.—p. 47.
Controlled Clinical Evaluation of Two Hematinic Agents. L. J. Cass, W. S. Frederik and S. di Gregorio.—p. 51.
Certain Small Painful Tumors of Extremities. M. B. Dockerty.—p. 57.
Low Back Pain—Referred Pain from Deep Somatic Structure of Back. R. J. Dittrich.—p. 63.

73:83-114 (March) 1953

Diagnosis and Treatment of Acute Cerebrovascular Lesions. A. A. Bailey. —p. 83.
Some Current Concepts of Viruses and Tumors. C. H. Andrewes.—p. 87.
Wendell Hughes Method of Blepharopoiesis. E. A. Rudolph.—p. 90.
Blood Pressure Problem. E. L. Bortz.—p. 93.

Kansas Medical Society Journal, Topeka

54:97-156 (March) 1953

*Treatment of Cervical Stump Carcinoma. G. M. Tice.—p. 98.
Pheochromocytema (Diagnosis and Use of Regitine During Surgery). T. K. Lin and E. G. Dimond.—p. 103.
Two Cases of Chylous Ascites and Chylothorax in Infants with Recovery. M. J. Blood and R. C. Fairchild.—p. 108.
Atresia of Tricuspid Valve with Large Interauricular Septal Defect, Pulmonary Stenosis and Patent Ductus Arteriosus. M. Bernreiter. —p. 112.
Radiographic Diagnosis of Placenta Previa. P. E. Hiebert and D. A. Kubin.—p. 113.
Cyst of Left Adrenal Gland. H. R. Wahl and E. P. Carreau.—p. 116.
Repair of Large Abdominal Wall Defects with Fiberglas Fabric. C. A. Hardin.—p. 117.
*Treatment of Hyperthyroidism with Radioactive Iodine, I^{131}. M. S. Allen, H. H. Dunham, C. E. Montgomery and E. T. Siler.—p. 120.

Treatment of Cervical Stump Carcinoma.—Of 240 patients with carcinoma of the cervix treated by the author between 1933 and 1953, 26 (10.8%) were treated for carcinoma of the cervical stump. Most gynecologic surgeons consider two years as the dividing line in separating the "true stump cancer" cases from those in which the cancer was present but not recognized at the time of hysterectomy. Of the author's 26 cases, 13 occurred two years after supravaginal hysterectomy, which compares favorably with the figures given by others. The author as radiologist considers it of academic interest whether the case is a true stump cancer or a missed uterine-cervix cancer. Treatment is necessary in every case. In the present era of surgical use of antibiotics and blood banks, figures quoted by skilled surgeons indicate that mortality following complete hysterectomy is no greater than that seen with supracervical hysterectomy. Of the author's 26 patients, 12 are living and 14 are dead. Of the 12 living patients, 7 have lived beyond the five-year period, constituting a 23% five year survival, which is slightly lower than the five-year survival of 26.3% for all cancers of the cervix as reported by nine large clinics. Treatment consists of local irradiation of the cervix supplemented by external irradiation. In most cases in the past treatment has been with radium applied locally in the form of a contact capsule or interstitial needles. In the author's hands transvaginal irradiation has seemed safer and more efficient than locally applied radium. His present technique uses x-rays with a half value layer of 1 to 15 mm. of copper, depending on the bulk of the tumor to be treated. A dose of 500 r to 750 r is administered daily through the transvaginal port. On the same day x-rays are administered through two external ports, crossfiring the pelvis. There may be as many as 20 separate applications. The one-field treatment plan for transvaginal roentgen therapy is limited as to dosage by the reaction at the level of the external os. Up to now an air dose of 7,500 r to 10,000 r directed at the cervix through a single port has been used.

Treatment of Hyperthyroidism with Radioactive Iodine.—From May, 1950, to December, 1952, 111 patients with hyperthyroidism were treated with I^{131} at the University of Kansas Medical Center. Of these, 50 have been followed for at least six months since their last treatment. Remission of thyrotoxicosis occurred in 79 of the 111 patients. Results were unsatisfactory in 3, and were not evaluated in 29. Among the 50 patients who have been followed up for six months or more, remission occurred in 48 (96%) and 2 were therapeutic failures. Total doses of I^{131} in this group ranged from 3 to 29 mc. in patients with diffuse toxic goiters, with an average dose of 10.5 mc. The six patients with nodular toxic goiter required total doses of from 9 to 67 mc., the average being 29 mc. Clinical myxedema occurred in 7 (14%) of the 50 patients. The failure of treatment in two patients was attributed to previous administration of iodine-containing medications or diagnostic contrast mediums. Attempts at I^{131} therapy were ill-advised in these patients. Radioactive iodine uptake rates below 20% at the two month follow-up period predicted sustained remission of thyrotoxicosis in all but one patient. Exophthalmos was present in 29 of the 111 patients. Of the 29 patients, 17 were followed at least six months; 7 showed marked improvement in the exophthalmos, slight improvement

occurred in 4, and no change was observed in 6. Retreatment was frequently necessary to bring about a sustained remission of hyperthyroidism and apparently did not increase the incidence of post-treatment myxedema.

Kentucky State Medical Assn. Journal, Bowling Green

51:85-130 (March) 1953

Small Bowel Tumors with Presentation of 12 Cases. A. E. Grimes and W. T. Swartz.—p. 85.
Civil Defense Health Services and Special Weapons Defense. N. C. Kiefer.—p. 93.
Surgery of the Hand. R. J. Rust.—p. 98.
Diagnosis of Lung Lesions. P. D. Crimm.—p. 104.
Infant Mortality. F. P. Helm.—p. 108.

51:131-180 (April) 1953

Advances in Surgical Management of Carcinoma of Colon. E. M. Bricker.—p. 131.
Public Health Policies. B. Underwood.—p. 137.
Obstetrical Anesthesia in General Practice. W. F. Sergent.—p. 139.
Mitral Stenosis—Its Surgical Correction. W. B. Davis, J. R. Bryant and J. S. Harter.—p. 141.
Management of Cancer of Cervix. J. A. Corscaden.—p. 146.
Otalgia. W. L. Woolfolk.—p. 151.
Treatment of Burns in Case of Atomic Warfare. H. S. Harris.—p. 155.

Laryngoscope, St. Louis

63:87-174 (Feb.) 1953. **Partial Index**

*Late Development of Laryngeal and Pharyngeal Carcinoma in Previously Irradiated Areas. P. H. Holinger and W. F. Rabbett.—p. 105.
Endaural Modified Radical Mastoidectomy. J. A. Moore.—p. 113.
Advances in Use of Antibacterial Substances. P. A. Bunn.—p. 128.
Osteoma of External Wall of Frontal Bone. Removal by Endonasal Plastic Approach. N. L. Fineberg.—p. 137.

Late Development of Laryngeal and Pharyngeal Carcinoma in Irradiated Areas.—Holinger and Rabbett describe three patients with malignant lesions of the pharynx and larynx in whom the tumor developed in an area previously irradiated for a benign lesion. Two of these three patients were women. All three of the patients had been given roentgen irradiation for tuberculous infection of the cervical lymph nodes, 32, 30 and 27 years previously, respectively. The two women now have a squamous cell carcinoma and the man a fibrosarcoma in the direct line of the previously administered irradiation therapy. A review of the literature revealed the reports of 10 similar cases. The total series of 13 included 4 men and 9 women. The irradiation therapy had been given either for tuberculous cervical adenitis or for thyrotoxicosis from 20 to 32 years before the development of the neoplasm. The authors do not believe that the association of the irradiation and the development of the tumor is merely coincidental. Since irradiation therapy was commonly given for benign conditions of the neck several decades ago, more of these cases may be seen in the near future.

Medical Annals of District of Columbia, Washington

22:115-168 (March) 1953

Acute Hypotension and Cerebral Hemodynamics: Preliminary Report. F. A. Finnerty Jr., L. Witkin and J. F. Fazekas.—p. 115.
Treatment of Dysmenorrhea with Dioxolane. A. E. Vivino and G. Ritter.—p. 117.
Relationship of Gastric Ulcer to Gastric Cancer. G. T. Pack, A. O. Hampton, F. C. Helwig and others.—p. 119.
Acute Cholecystitis: Comparative Study of 60 Consecutive Cases of Acute Cholecystitis Treated by Immediate Surgery and 60 Consecutive Cases Treated by Delayed Surgical Intervention. A. Horwitz, R. G. McCorkle Jr. and S. Alpert.—p. 127.
Tuberculosis Survey and the General Practitioner. I. P. Frohman.—p. 133.

Nebraska State Medical Journal, Lincoln

38:33-76 (Feb.) 1953

Control of Heart Failure. J. Ritter.—p. 35.
Prevention of Rheumatic Heart Disease. G. E. Stafford.—p. 39.
Present Status of Cardiovascular Surgery. B. R. Walske.—p. 42.
Significance of Arrhythmias in Myocardial Infarction. D. F. Purvis.—p. 55.
Practical Electrocardiography. S. L. Magiera.—p. 58.

Neurology, Minneapolis

3:163-238 (March) 1953

Studies of Spinal Cord. 3. Pathways for Deep Pain Within the Spinal Cord and Brain. R. E. Yoss.—p. 163.
Aphasic Difficulties Understanding Spoken Language. H. Schuell.—p. 176.
Studies in Temperature Regulation: 1. Response of Normal Men to Changes in Environment Temperature. N. B. Dobin, O. E. Hepler, I. C. Sherman and others.—p. 185.
Intellectual Functions in Aphasic and Non-aphasic Brain Injured Subjects. R. M. Reitan.—p. 202.
Hydrocephalus with Vascular Malformations of Brain: Preliminary Report. H. M. Askenasy, E. E. Herzberger and H. S. Wijsenbeek.—p. 213.
Practical Considerations in Treatment of Epilepsy. E. R. Ives.—p. 221.

New England Journal of Medicine, Boston

248:441-480 (March 12) 1953

*Cancer of Lung in Physicians. E. L. Wynder and J. Cornfield.—p. 441.
*Acute Postoperative Pancreatitis. J. E. Dunphy, J. R. Brooks and F. Achroyd.—p. 445.
Epidemic Hepatitis. P. N. Wahi and M. M. Arora.—p. 451.
Ruptured Myocardial Infarct with Survival for Three Weeks. P. T. Lampesis, W. D. Crandall and S. J. King.—p. 455.
Endoscopy. E. B. Benedict.—p. 457.
Apresoline Intolerance with Bladder Paralysis. D. R. Laurence and N. A. Miles.—p. 464.

Cancer of Lung in Physicians.—Letters and questionnaires were sent to the estates of physicians who had died of cancer of the lung, colon, stomach, kidney and bladder, leukemia, lymphoma, and sarcoma. Death notices in THE JOURNAL provided information about the primary diagnosis. The years 1950 and 1951 and the first two months of 1952 were selected; with regard to cancer of the lung, death notices of 1949 were included in this investigation. Of the 118 questionnaires mailed to the relatives of physicians who had died of pulmonary cancer, 63 were completed, and of the 214 questionnaires sent to the relatives of physicians who had died of other forms of cancer, 133 were completed. Exposures to possible respiratory irritants were studied in 63 physicians with cancer of the lung and 133 physicians with cancer outside the respiratory tract. A highly significant association between the use of tobacco and the development of pulmonary cancer was found among physicians. The estimated mortality from cancer of the lung rose from 10 per 100,000 among nonsmoking physicians to 133 per 100,000 among physicians smoking 35 or more cigarettes a day. There were no significant differences in exposure to respiratory irritants other than tobacco among the two groups. These results agree with those of previous studies. The mortality rate was greatest among cigarette smokers, but even among cigar and pipe smokers it was greater than that among nonsmokers, indicating an association of cancer to all three forms of smoking, even though this relation appears greatest with cigarette smoking.

Acute Postoperative Pancreatitis.—Dunphy and co-workers describe eight cases of acute postoperative pancreatitis, which they observed over a period of two years, and they also cite studies carried out by others. They feel that acute postoperative pancreatitis is a tragic and somewhat inexplicable accompaniment of surgical operations. It occurs more frequently than has been supposed, and may follow operations in which trauma to the pancreas, reflux of bile into the pancreatic ducts, or obstruction of the main pancreatic ducts can be excluded. Usually, however, it follows operations on the biliary tract and stomach, which involve mobilization and manipulation of the pancreas. Minor interference with the blood supply to the pancreas may be an important factor, if combined with trauma to the gland or partial obstruction to the pancreatic ducts. The posterior pancreaticoduodenal artery and the duct of Santorini are particularly vulnerable to injury when the duodenum is mobilized during gastrectomy. In cases in which major obstruction or injury to the ducts can be excluded, sludging of the pancreatic secretions incidental to medication, dehydration, or other factors associated with surgical operations may be a contributing factor that merits further investigation.

New Jersey Medical Society Journal, Trenton

50:87-126 (March) 1953

Hiatus Hernia. L. F. Baum and O. S. Baum.—p. 91.
Acute Myocardial Infarction Without Pain. W. Stein.—p. 95
Prolonged Home Control of Intractable Asthma by Intravenous ACTH. N. Swern and R. N. Cagan.—p. 98.
Problems of Psychiatric Hospitals. J. B. Gordon.—p. 101.
Treatment of Radiation Pneumonitis with Cortisone. S. G. Bluestein and J. Roemer.—p. 106.
Subacute Bacterial Endocarditis in Middle and Later Life: With Report of Two Cases. H. Sobol.—p. 108.

New York State Journal of Medicine, New York

53:481-592 (March 1) 1953. **Partial Index**

Cancer of Breast. F. E. Adair.—p. 519.
Newer Technics for Separation and Fractionation of Whole Blood. J. L. Tullis.—p. 525.
Blood Group Substances. S. M. Beiser.—p. 528.
Emergency Transfusions. E. Witebsky.—p. 530.
New Method for Rapid Determination of Blood Groups in Emergency Situations. C. P. Emerson.—p. 532.
Immunization to Rare Blood Factors. P. Levine.—p. 534.
Newer Blood Factors Encountered in Blood Tranfusions. R. E. Rosenfield, P. Vogel and G. Ohino.—p. 536.
Transfusion Reactions During 12 Years of Banked Blood at Presbyterian Hospital. J. Scudder.—p. 538.
Methods for Testing Functional Behavior of Blood Platelets. B. Rovatti. —p. 543.
Concentration and Transfusion of Platelets Separated from Normal Blood. A. H. Minor and L. Burnett.—p. 547.
Transfusion of Human Blood Platelets. E. O. Hirsch.—p. 549.
Therapeutic Trials with Thrombocytosin in Treatment of Purpura Hemorrhagica. S. E. Moolten.—p. 550.
Nonprotein, Non-Nitrogenous Allergenic Phenomena. T. M. Feinblatt and E. A. Ferguson Jr.—p. 566.
New Home Treatment for Early Cases of "Croup." R. J. Mehr.—p. 568.

Pennsylvania Medical Journal, Harrisburg

56:81-160 (Feb.) 1953

Some Recent Advances in Clinical Endocrinology. E. P. McCullagh. —p. 97.
The Doctor of the Future. T. Parran.—p. 103.
Current Status of Exchange Resins in Electrolyte Disturbances. T. S. Danowski and L. Greenman.—p. 108.
Seven-Year Analysis of Deaths from Acute Appendicitis in Philadelphia—1944 to 1950. F. A. Bothe.—p. 111.

56:161-240 (March) 1953

Medical Treatment of Occlusive Arterial Disease of Extremities. E. A. Hines Jr.—p. 185.
"Cat Scratch Disease." W. N. Campbell and T. G. Anderson.—p. 188.
Mass Treatment of Burns. J. E. Rhoads.—p. 191.
Acute Shoulder Injuries A. F. DePalma.—p. 195.
Preoperative Cardiovascular Evaluation in Elderly Urologic Patient. C. A. Laubach Jr.—p. 199.

Plastic & Reconstructive Surgery, Baltimore

11:169-246 (March) 1953

Immediate Attachment of Double Pedicled Tubed Flaps to Carrier (Wrist) in Preparation for Transfer to Distant Site. C. G. Neumann and J. Von Wedel.—p. 169.
Plastic Construction of Artificial Vagina: Further Experiences. T. G. Blocker Jr., S. R. Lewis and C. C. Snyder.—p. 177.
Reconstruction of Cervical Esophagus. W. L. Watson and J. M. Converse.—p. 183.
*Hemangiomas: Role of Plastic Surgery in Early Treatment for Prevention of Deformities and in Repair of Late Lesions and Defects. J. B. Brown and M. P. Fryer.—p. 197.
Tantalum Oxide Powder. W. L. Hughes.—p. 211.
Congenital Neoplasms of the Nose. W. B. McComber and M. K. Wang. —p. 215.
Use of Free Full-Thickness Skin Grafts in Incisional Hernias. V. Spina and L. E. Reginato.—p. 230.

Plastic Surgery in Treatment of Hemangioma.—Arterial hemangioma may occur anywhere on the body as a bright red area, usually raised from the surface, and may be multiple. This red area may be only part of the tumor, as it may extend out beneath the skin around the more noticeable red portion. The tumor may also occur in a spotty arrangement, sometimes with the deeper elements connecting the more superficial red areas. The arterial hemangioma is locally destructive. When it is called a "birthmark" or "strawberry mark," the "friendly" terms, themselves, may lend false security in what has been observed to be a potentially dangerous lesion, although some arterial hemangiomas may regress spontaneously. Small raised or flat tumors located where the resulting scar is of no practical importance can most easily be completely destroyed with a fine cautery. If all arterial hemangiomas could be seen at this stage of development, there would be no need for further discussion of treatment. Some of these lesions can be surgically excised and the wound closed if the location permits. Most of the ones observed by the authors occurred about the face where excision and closure would require removal or distortion of a feature. Extensive resurfacing with a graft on the face is seldom the immediate treatment, and flap coverage may be even less desirable. Primary surgical resection of large growths might be dangerous to life. Minimal interstitial irradiation with gold radon seeds has been found satisfactory in many instances. External irradiation by radium or x-rays may be used, but may be impractical because of the difficulty of holding the radium in place on a small infant, or because it may be almost impossible to hold the infant still for a calculated dose of x-rays. Interstitial irradiation also is of advantage in the treatment of the more solid endothelioma beneath the skin. With the aid of photographs and legends, the authors present additional observations on the use of the multiple suture control of large vessel angiomas along with details of minimal interstitial radiation treatment of bright red or arterial hemangiomas. They also refer to their earlier reports on this form of treatment, and they cite the opinions of other observers.

Postgraduate Medicine, Minneapolis

13:281-382 (April) 1953. **Partial Index**

Education for Careers in Public Health. J. S. Simmons.—p. 281.
Physician's Role in Preventive Medicine and Public Health. H. R. Leavell.—p. 287.
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Nutritional Research in Public Health. F. J. Stare and the Staff of Department of Nutrition.—p. 304.
Health Problems of Mothers and Children. S. B. Kirkwood, S. W. Dooley and H. C. Stuart.—p. 309.
Solving a Community Health Problem. J. E. Gordon, H. R. Leavell and T. H. Ingalls —p. 318.
Industrial Health. P. Drinker, L. Silverman, C. P. Yaglou and others. —p. 323.

Proc. Staff Meet. Mayo Clinic, Rochester, Minn.

28:121-144 (March 11) 1953

*Micrococcic (Staphylococcic) Enteritis as a Complication of Antibiotic Therapy: Its Response to Erythromycin. W. H. Dearing and F. R. Heilman.—p. 121.
Electrical Rhythms Recorded from Depth of Frontal Lobes During Operations on Psychotic Patients. R. G. Bickford, A. Uihlein and M. C. Petersen.—p. 135.

Erythromycin to Counteract Enteritis Resulting from Antibiotic Therapy.—In this paper Dearing and Heilman present additional evidence that resistant strains of Micrococcus pyogenes (staphylococci) may develop in patients as a result of administration of antibiotic agents. These resistant strains of micrococci (staphylococci), when present in the intestinal tract in large numbers, may produce varying degrees of gastrointestinal and systemic reactions. The 44 patients reviewed here had been hospitalized for some illness or surgical procedure. Cultures were made from the intestinal lumen at the time of operation on the intestinal tract in some of these patients who had received oxytetracycline (Terramycin) prior to such operations. If micrococci were found, one of two procedures could be used: 1. The patient received erythromycin prophylactically the day after operation, 2. The patient was observed to ascertain whether symptoms would develop if no erythromycin was administered. Oral administration of erythromycin was then begun if symptoms did occur. Erythromycin was given orally in doses of either 300 or 400 mg. four times daily until the untoward symptoms subsided and the micrococci disappeared from the stool. Many of the patients who experienced diarrhea after antibiotic therapy had cultures of the stool made to determine whether Micrococcus pyogenes was present. The data on these 44 patients are summarized. There was suggestive but not conclusive evidence that this micrococcic enterotoxic reaction is not necessarily related to pseudomembranous enterocolitis.

Quarterly J. Studies Alcohol, New Haven, Conn.

14:1-164 (March) 1953. **Partial Index**

Heredity of Experimental Alcohol Preference in Rats: II. Coefficient of Heredity. J. Mardones R., N. Segovia M. and A. Hederra D.—p. 1.
Voluntary Consumption of Alcohol in Rats with Cirrhosis of the Liver: Preliminary Report. T. B. Sirnes.—p. 3.
Effect of Intraperitoneal Administration of Alcohol on Adrenal Levels of Cholesterol and Ascorbic Acid in Rats and Guinea Pigs. J. C. Forbes and G. M. Duncan.—p. 19.
Effect of Vitamin C Intake on Adrenal Response of Rats and Guinea Pigs to Alcohol Administration. J. C. Forbes and G. M. Duncan.—p. 22.
*Treatment of Alcoholism with Adrenal Steroids and ACTH. W. L. Voegtlin.—p. 28.
Self-Related and Parent-Related Verbalizations and Bender-Gestalt Performance of Alcoholics. S. L. Kates and M. F. Schmolke.—p. 38.
Consideration of Parental Deprivation and Other Factors in Alcohol Addicts. J. E. Oltman and S. Friedman.—p. 49.
Surrender Versus Compliance in Therapy with Special Reference to Alcoholism. H. M. Tiebout.—p. 58.

Adrenal Steroids and Corticotropin in Alcoholism.—Voegtlin began to treat alcoholic patients by the alternate administration of adrenal steroids and corticotropin in November, 1950. He now reviews his experiences with this treatment in 39 patients (36 men and 3 women) over a period of 18 months. Thirty-six of the patients were chronic relapsers, having failed to remain abstinent after previous treatment by other methods, although some had been sober for long periods prior to relapse. The other three patients were given adrenal therapy initially because there were contraindications to treatment by the conditioned-reflex method. Twenty of the patients received adrenal therapy as their only treatment. Of the remainder, 15 received thiopental (Pentothal) narcosynthesis in addition and 4 were given both pentothal and conditioned-reflex therapy coincidentally. It was decided that the adrenal steroids should be given in "courses" of 28 days, this to be followed by a rest period of 7 days, this by 3 days of treatment with corticotropin and then another rest period of 7 days. Thus treatment resolved itself into a cycle of 45 days that was repeated over and over. Subjective evaluation was made during the first cycle and the amount of steroid medication reduced during each succeeding cycle so long as the subjects continued to feel well or failed to note any sensation of being "let down" by the decreased dosage. When the dosage of adrenal steroid had been reduced to a low level, usually after six to nine months of treatment, the administration of corticotropin was discontinued. The rest period of seven days between each succeeding 28 day period of steroid medication was continued, however. Voegtlin found that these drugs promptly ameliorate the immediate sequels of excessive indulgence in alcohol. The craving for liquor quickly subsides and evidence of toxemia often subsides within 24 hours. Delirium tremens is controlled or its appearance prevented by this treatment. Forty per cent of the patients remained abstinent for periods up to 12 months and 18% up to 18 months. Less than 20% were definitely improved although not entirely abstinent. In the others, benefit was questionable or entirely absent. The author believes that adrenal therapy will prove to be of little specific value in the treatment of alcoholism except as an adjunct to other existing methods of treatment.

Rocky Mountain Medical Journal, Denver

50:233-298 (March) 1953

Personality Growth and Development. O. S. English.—p. 255.
The Doctor's Office: Appraisal of Its Efficiency. T. Wiprud.—p. 261.
Treatment of Metabolic Exophthalmos. G. D. Ellis and J. C. Long.—p. 265.
Use of Stainless Steel Mesh in Repair of Inguinal Hernia. R. Woodruff and A. E. James.—p. 270.
When an Epidemic Strikes Your Community: Public Welfare and Public Relations Aspects of Recent Typhoid Fever Epidemic in Southern Colorado. D. R. Barglow.—p. 273.

South Carolina Medical Assn. Journal, Florence

49:33-60 (Feb.) 1953

Ophthalmoscopic Findings and Their Interpretation in Cardio-Vascular Diseases. J. W. Jervey.—p. 33.
Anorectal Lymphogranuloma Venereum. L. Banov Jr.—p. 35.
Cancer of the Cecum—a Challenge. C. A. Sweatman.—p. 38.

Surgery, St. Louis

33:321-480 (March) 1953. **Partial Index**

*Treatment of Intracranial and Cranial Suppuration with Reference to Local and Systemic Use of Bacitracin. P. Teng and F. L. Meleney.—p. 321.
Studies on Intrahepatic Arterial Circulation. F. Glauser.—p. 333.
Effects of Temporary Occlusion of Afferent Hepatic Circulation in Dogs. F. L. Raffucci.—p. 342.
Antral Phase of Gastric Secretion Before and After Vagotomy—Experiments on Gastric Pouch Dogs. D. J. Ferguson.—p. 352.
Removal of Xyphoid Process as an Aid in Operations on Upper Abdomen. J. H. Saint and L. E. Braslow.—p. 361.
Further Studies on Role of Bacteria in Death from Acute Pancreatitis in Dogs. F. Schweinburg, S. Jacob, L. Persky and J. Fine.—p. 367.
Metastatic Tumors in Breast: With Report of 10 Cases. H. Charache.—p. 385.
*Simultaneous Ruptured Ectopic and Intrauterine Pregnancy. H. A. Kazmann and L. A. Barnett.—p. 391.
Pyloroduodenum and Gastric Resection. D. Macdonald.—p. 394.
Effect of Cortisone on Healing of Wounds in Cardiovascular System. W. H. Muller Jr., F. C. Spencer and A. E. Lewis.—p. 399.

Use of Bacitracin in Cranial Suppuration.—Teng and associates report on 14 patients with neurosurgical infections who were treated with bacitracin in different hospitals. Although this group is relatively small, it includes cases illustrating suppurations involving the different layers of the intracranial contents, from the ventricular system outward, as well as the cranium itself and the overlying soft parts. The patients included 7 with intracranial suppurations (3 with brain abscesses, 3 with septic meningitis, and 1 with subdural empyema associated with an intracerebral abscess) and 4 patients with infected craniotomy wounds, 3 of whom had a chronic osteomyelitis of the skull. Bacitracin was given by the intrathecal, intracerebral, or intraventricular route with or without intramuscular injection of bacitracin. One of these 11 patients died of gastrointestinal and pulmonary complications. All the others survived. Bacitracin was used prophylactically in three patients, two with acute postoperative aseptic meningitis and one with a compound fracture of the skull resulting in cerebral fungation. The antibiotic was administered intrathecally in the former cases and intracerebrally in the latter. The application of bacitracin directly into and on the surface of the central nervous system produced no untoward effects. Bacitracin seems to be the antibiotic of choice for neurological infections, because the organisms are usually sensitive to bacitracin and no toxic signs are observed following the local application of bacitracin solution into the ventricles, to the infected area of the brain, or into the subarachnoid space. "Shotgun" antibiotic therapy is not advisable. The organism should be isolated and tested for sensitivity in order to ascertain the most effective antibiotic and to render treatment adequate as early as possible. Bacitracin is suitable for prophylactic use in contaminated neurosurgical wounds.

Simultaneous Ruptured Ectopic Pregnancy and Intrauterine Pregnancy.—A 24-year-old woman who had had two normal deliveries, five and four years previously, was hospitalized because of abdominal pain and shock. Five days before she had had a sudden abdominal pain, referred to both shoulders, which was so severe that she fainted. She recovered from this attack, however, and except for persistent nausea and occasional vomiting, seemed better and was ambulatory until about one hour before admission, when she fainted again and the abdominal pain returned. At examination a right lower quadrant mass was taken to be a ruptured ectopic pregnancy and, while the probability of an intrauterine pregnancy was considered, it was decided to do a laparotomy because of obvious intra-abdominal bleeding. The uterine fundus was soft, symmetrical, and enlarged to the size of a three months' pregnancy. The left tube was buried in the posterior surface of the broad ligament, and the ovary was small and buried in the same mass of inflammatory tissue. The right ovary contained a corpus luteum and the right tube contained a placental mass and showed a rupture in its distal one-third. A fetus, the size of a 10-week pregnancy, was attached to this mass by an umbilical cord, but floated free in the surrounding blood. The right tube and contents were removed and the abdomen closed. The patient did well, and was discharged on the eighth day. The intrauterine pregnancy continued to term, a normal baby girl being delivered spontaneously.

FOREIGN

Acta Medica Scandinavica, Stockholm

144:399-484 (No. 6) 1953. **Partial Index**

Acute Anuria with Special Reference to Renal Function. F. Berglund, J. Ek and L. Werkö.—p. 399.
Polyradiculitis Cervicalis Infectiosa (Myalgia Nuchae Epidemica). J. Ström.—p. 408.
Epidemic of Measles in Southern Greenland, 1951, in Virgin Soil: II. Epidemic Proper. P. E. Christensen, H. Schmidt, H. O. Bang and others.—p. 430.
Id.: III. Measles and Tuberculosis. P. E. Christensen, H. Schmidt, H. O. Bang and others.—p. 450.
Dermal Spreading of Hyaluronidase and Streptococci Under Influence of Stress (Cold), ACTH, Cortisone, and Desoxycorticosterone Acetate. G. Birke.—p. 455.
Hematopoietic Activity (Intrinsic Factor Effect) of Pure Pyloric Secretion from Hog. E. Landboe-Christensen and H. H. Wandall.—p. 467.

Epidemic of Measles in Southern Greenland.—In April 1951 an epidemic of measles occurred in a district of Southern Greenland among a population that had never before been in contact with this disease. The source of the infection was a young Greenlander, who while visiting in Denmark was in close contact with a person who shortly thereafter showed signs of measles. After his return to Greenland the young man attended a dancing festival in which a large number of inhabitants of the community took part; at least 200 persons were in close contact with him and all were presumably infected. Quarantine measures could not stop the epidemic until 4,257 of the 4,320 inhabitants of the district had been infected. Thanks to geographical circumstances and strict quarantine measures for the whole district, the disease could be limited to the district itself. The incubation period in the young man who was the source of the infection was 19 days; in most of the infected patients who were treated prophylactically with measles convalescent serum or with gamma globulin the incubation period was 13 to 14 days, while in those not prophylactically treated it varied from 4 to 10 days, calculated from the appearance of the rash in the source of the infection. The symptoms and signs of the disease in the patients who had not been treated prophylactically did not differ from those commonly observed. Of 266 persons whose oral cavity was examined daily, 200 (75%) had a pronounced enanthema of the oral mucosa in the prodromal stage. Conjunctivitis with photophobia was rarely observed. Of 1,657 patients not receiving prophylactic treatment 757 (45%) had complications. Of these 757 patients, 665 had pneumonia, which occurred most frequently in the prodromal stage and during the first two days of the rash and was treated immediately with penicillin. Otitis media occurred in only 80 patients. Circulatory failure occurring in 18 patients constituted the most serious complication of the epidemic. It was observed in patients of advanced age and in pregnant or puerperal women. Encephalitis occurred in six patients, with death resulting in four. Of 26 pregnant women with measles, 13 were delivered at term, whereas the other 13 gave birth to premature infants or aborted. No case of congenital measles was observed, and no congenital abnormalities were found in infants born of mothers who had contracted measles during pregnancy. Of the 4,257 patients with measles, 77 died (18 per thousand). Of 3,273 patients who had not received prophylactic treatment, 48 died (15 per thousand). Forty-seven of the 48 patients died in the course of the disease (18 in the prodromal stage) and one with tuberculosis died two weeks after the appearance of the rash. More than 60% of all deaths occurred in patients aged over 55. The epidemic left a distinct mark on the general mortality rate of 1951.

Measles and Tuberculosis.—Roentgen-ray chest examinations by means of a portable x-ray apparatus had been carried out in one of the villages in the district of Southern Greenland shortly before the outbreak of the epidemic of measles reported on in the previous paper. Of 363 persons examined, 58 had signs of tuberculosis. After the epidemic a second roentgen examination of the population of this village was performed by the same examiner and in the same way. Nineteen new cases of tuberculosis were detected, and the sputum of 13 of these patients contained Mycobacterium tuberculosis. Of the 58 patients in whom tuberculosis had been detected at the time of the first examination, 9 had died and 13 showed progression of their disease at the time of the second examination. These facts seem to justify the conclusion that measles caused reduced resistance to tuberculosis. During the late part of the epidemic of measles an investigation of the reactions of patients with measles to tuberculin was carried out in a small village; 51 persons were subjected to Moro's test at regular intervals of three to four days, beginning at the appearance of the rash and continuing until positive reactions to the test reappeared. Most of the patients had positive reactions again 8 to 12 days after the rash, and a few as late as 30 to 35 days after the rash. It was thus confirmed that the tuberculous allergy is temporarily reduced or absent during measles infection. Several cases of postprimary erythema nodosum were observed after recovery from measles.

Annales Chirurgiae et Gynaecologiae Fenniae, Helsinki

42:1-66 (No. 1) 1953. **Partial Index**

*Critical Evaluation of Medullary Nailing. G. Küntscher.—p. 1.
Blood Eosinophil Count in Evaluation of Indication for Surgical Operations on the Lungs. P. E. A. Nylander, A. Pekkarinen, L. E. Aro and M. Turunen.—p. 7.
Pericardial Diverticula. P. I. Halonen and H. Laitinen.—p. 23.
Carcinoma of Body of Uterus Combined with Ectopic Pregnancy. O. Kinnunen.—p. 33.
Noradrenaline Infusion: Use of Controlling Fall of Blood Pressure in Spinal Anesthesia. L. E. Aro and M. A. Wiljasalo.—p. 38.
*Course of Delivery in Women Athletes (Ball Players and Swimmers). K. Niemineva.—p. 48.

Medullary Nailing.—Küntscher stresses that medullary nailing, which is really a form of internal splinting, became possible only because of modern metallurgical advances, which provided rust-resisting alloys that are not corroded by body fluids. Suitable chemical composition is, however, only one essential requirement for the medullary nail; adequate strength is equally important. Küntscher's observation in many different European clinics convinced him that the nails used for internal splinting sometimes did not meet these essential requirements and as a result gave rise to complications that should not be attributed to the method itself. The nail must be more than equal to the load it is expected to bear. He has seen nails designed for splinting the bones of the leg that could easily be bent by mere hand pressure. Those who produce nails for internal splinting should be urged to test them for strength as well as for resistance to corrosion. He himself has carried out over 1,000 nailing operations and, with the exception of one case, never experienced bending of a nail. Breaking of nails occurred in two cases as the result of a new severe trauma. When breaking of nails was observed by other surgeons using the same types of nails he uses, it was found that a nail with too small a diameter had been used.

Obstetrical Course of Women Athletes.—Niemineva points out that during the first few decades of this century some gynecologists advised against strenuous, particularly competitive, sports for women, but later this view was refuted by others. This paper is concerned with obstetric observations on 53 women who had engaged in competitive ball games (the Finnish national nest-ball game) and 41 women who had participated in swimming contests. It was found that the fertility and gestation of these women was normal. The size of the pelvis in these athletes did not differ from that of other Finnish women. Their labors were of the same length, and the uterine contractions were normal. Lack of elasticity of the uterine os was not more frequent than usual and the same can be said about perineal tears. The incidence of cesarean and low forceps deliveries was normal. The author concludes that strenuous athletic activities have no adverse effects on the obstetrical function of women.

Archives des Maladies du Coeur, Paris

46:97-192 (Feb.) 1953. **Partial Index**

*Prognosis in Subacute Infectious Endocarditis Treated with Antibiotics: Results of Treatment in 202 Cases. E. Donzelot, J.-M. Le Bozec, H. Kaufmann and J.-E. Escalle.—p. 97.
Early Detection of Arterial Disturbances in Limbs of Diabetics. A. Jouve, J. Pierron and E. Bourdoncle.—p. 108.
Pyruvicemia and Cardiac Functional Neurovegetative Disturbances. J.-F. Merlen.—p. 117.
Intracardiac Pressure Curves in Constrictive Pericarditis. A. Tourniaire, J. Blum, F. Deyrieux and M. Tartulier.—p. 129.
Measuring the Heart Volume by Tomography. P. Broustet, C. Wangermez, Guillon and H. Bricaud.—p. 143.
Auriculo-Ventricular Dissociation Complicating a Pregnancy. A. Gaquière, Monet and Arnaud.—p. 151.

Subacute Infectious Endocarditis Treated by Antibiotics.—Results of antibiotic treatment of 202 patients with subacute infectious endocarditis, some with a follow-up of seven years, were studied in relation to prognosis. There were 49 deaths during treatment or within three months afterward caused by persistence of the infection, often with cardiac and renal complications, or by the development or exacerbation of cardiac or renal insufficiency in spite of regression of the "infectious syndrome." Results among the survivors were considered good when the patient's condition was excellent or permitted almost normal activity and poor when symptoms indicated exacerbation of the cardiac condition or renal or neurological sequelae. Follow-up of from 1 to 7 years showed 21 late deaths and 132 survivors, of whom 120 had good results, 4 had poor results, and 8 failed to reply to letters in 1952. Heart failure was the principal cause of the late deaths. The immediate death rate is highest in the primary forms of subacute infectious endocarditis, with the abacterial forms and those occurring in patients with aortic affections next in order. Subacute infectious endocarditis rarely occurs in patients in heart failure, but when it does it is fatal. Factors affecting the prognosis unfavorably are prolonged febrile episodes; cardiac complications, such as angina, acute cor pulmonale, bundle-branch block, and especially heart failure; and renal insufficiency. Persons who have apparently recovered from subacute infectious endocarditis still have heart disease, and, even though their condition seems satisfactory, they may sooner or later have recurrences caused by a fresh infection or show signs of cardiac deterioration or renal insufficiency. Recurrences and renal insufficiency are rare, but heart failure appears in 10% of the survivors within from 3 to 60 months. The late results in this series show that a stable cure was obtained in 65% of the severe cases and that the classic form of subacute infectious endocarditis in a patient of middle age, with a history of rheumatic fever, with no previous heart failure, and with positive blood cultures was cured in 83% of the patients, more than 70% remaining alive and well from four to seven years after the end of treatment.

Ärztliche Forschung, Munich

7:85-136 (March) 1953. **Partial Index**

Pharmacologic Aspects of Pain Sensation. K. Soehring.—p. 85.
Critical Evaluation of Vitamin T (Goetsch) on Pathogenic Leptospirae. H.-G. Gram and H.-W. Schlipköter.—p. 97.
Verification of Action of Horse Chestnut Extract on Capillary Permeability. H. Küchmeister.—p. 102.
Mode of Action of Salicylic Acid: Curing Rheumatism by Damaging the Liver? H. Schumacher.—p. 117.
*Fate of Intravenously Administered Iron. W. Lintzel.—p. 134.

Fate of Intravenously Injected Iron.—The fate of intravenously administered iron was investigated in young cats with iron deficiency. Examination of the organs of these animals from two to three days after the last injection of iron revealed that most of the iron was deposited in the liver. After injection of very large amounts that greatly exceeded the therapeutic doses, some iron deposits were found in the lungs and occasionally in the spleen. The kidneys always remained free of iron. Since passage through the liver is the best for therapeutic utilization, intravenous administration of iron seems to provide an efficient and rapid method to compensate for an existing iron deficiency.

British Journal of Venereal Diseases, London

29:1-56 (March) 1953

Cortisone in Treatment of Syphilitic Eye Disease. A. N. Ashworth.—p. 3.
Investigation into Use of Cardiolipin Antigens. I. Anticomplementary Action of Cardiolipin. I. N. O. Price.—p. 12.
Penicillin Treatment of Cardiovascular Syphilis. H. Beerman.—p. 18.
Fixed Eruption Due to Sulphonamide Hypersensitivity. D. J. Campbell and J. O. Doyle.—p. 32.
Residual Non-Gonococcal Urethritis: P.A.M. and Sulphathiazole in Treatment of Gonorrhoea. C. D. Alergant.—p. 34.
Terramycin in Early Lymphogranuloma Venereum. K. S. Henley.—p. 36

British Medical Journal, London

1:577-632 (March 14) 1953

Opportunities for Research in General Practice. R. Platt.—p. 577.
Is Early Treatment Essential in Cancer? S. Russ.—p. 580.
Early Diagnosis and Treatment of Carcinoma of Nose. E. D. D. Davis.—p. 582.
*Survey of 647 Cases of Leukaemia, 1938-51. W. R. Gauld, J. Innes and H. N. Robson.—p. 585.
Effects of Glandular Fever Infection in Acute Leukaemia. A. W. Taylor.—p. 589.
Monocytic Leukaemia Presenting as Polyarthritis in an Adult. J. R. Hindmarsh and D. Emslie-Smith.—p. 593.
Mass Treatment of Treponemal Diseases, with Particular Reference to Syphilis and Yaws. T. Guthe, F. W. Reynolds, P. Krag and R. R. Willcox.—p. 594.
Proguanil and Blackwater Fever. I. Singh.—p. 598.
Renal Excretion of Urea in West African. R. A. Kenney.—p. 600.

Survey of 647 Cases of Leukemia.—Two separate surveys were carried out in Scotland of 647 patients with leukemia, 440 of whom were admitted to hospitals in Edinburgh and 207 in Aberdeen between 1938 and 1951. Contrary to previous reports, the commonest type was chronic lymphatic leukemia, followed by the chronic myeloid, acute lymphatic, acute myeloid, and monocytic types, in that order. In about one-fifth (140) of the total number of cases the blood contained no leukocytes. This phenomenon occurred most frequently in the acute forms of the disease and was least common in chronic myeloid leukemia. The age incidence of the chronic lymphatic (average age 61.5 years), of chronic myeloid (average age 49.8 years), and of acute lymphatic types (average age of 20.4 years) conformed to the previously reported figures, but acute myeloid and monocytic leukemia with age ranges of from 14 months to 80 years, and from 9 months to 86 years, respectively, showed a much wider range of incidence than is generally reported. Males were affected oftener than females, in the ratio of 7 to 6. The male predominance was most pronounced in chronic lymphatic leukemia, and was less obvious or not evident in the other types. Evidence is presented that suggests that there has been a two-fold increase in the over-all incidence of leukemia in Scotland over the period of this survey. There seems to have been a particular increase in the lymphatic type of the disease, but the incidence of all forms is increasing.

Lancet, London

1:503-554 (March 14) 1953

*Q Fever in Great Britain: Analysis of 69 Sporadic Cases, with Study of Prevalence of Infection in Humans and Cows. B. P. Marmion, M. G. P. Stoker, J. H. McCoy and others.—p. 503.
Bacteriophage Typing of Strains of Staphylococcus Aureus from Various Sources. R. E. O. Williams, J. E. Rippon and L. M. Dowsett.—p. 510.
Bacteriophage Typing of Strains of Staphylococci Isolated in Australia. P. M. Rountree.—p. 514.
Treatment of Cerebral Gliomas with 24-Million-Volt X-Rays. D. A. Layne, V. Logue, W. V. Mayneord and others.—p. 516.
Cat-Scratch Disease: Intradermal Test in Controls. F. R. Bettley and E. A. Fairburn.—p. 520.
Use of Terramycin in Infections in Diabetics, with Special Reference to Gangrene. J. B. Walker.—p. 521.
Maintenance of Trendelenburg Position by Skin Friction. C. L. Hewer.—p. 522.
Urine in Seven Cases of Chronic Cor Pulmonale. J. J. Segall.—p. 524.

Q Fever in Great Britain.—Explosive outbreaks represent only one aspect of Q fever in Britain. Because the final diagnosis of Q fever depends on a retrospective laboratory test, the cases identified probably represent but a small proportion of the total number that actually occur. Judging by specimens received at the Virus Reference Laboratory, Colindale, Q fever accounts for 9% of cases of atypical pneumonia (com-

pared with 8% due to influenza and 1% due to psittacosis) and for 5% of pyrexias of unknown origin. The principal sources of human infection are now known to be cattle, sheep, and goats, animals that may appear to be healthy but excrete the Q fever organism in the feces, urine, milk, placenta, and fetal membranes. Man is probably infected either by inhaling dust contaminated with these excreta or by drinking infected milk. The organism is remarkably hardy, and the pasteurization methods provide only marginal safety. It also resists many disinfectants and can persist in dust for long periods in normal ranges of temperature and humidity. This may explain why Q fever is not limited to those whose residence, occupation, or habits bring them into direct contact with cattle, sheep, or goats, or their products. Excluding outbreaks, 69 sporadic cases of Q fever have been identified in Britain since the disease was first discovered there in 1948; 58 of these had typical clinical attacks, usually resembling atypical pneumonia. Four patients died during the infection, 2 with pulmonary infarction, and one of these may have had chronic Q fever. Two-thirds of the patients gave a history of exposure to known sources of Q fever. Of 4,407 normal blood donors in England and Wales, 91 (2.13%) showed serological evidence of previous infection with Q fever. Examination of the milk from 1,031 herds of cattle showed that 8.2% of the herds in Kent were excreting Rickettsia burnetii in the milk, compared with 2.7% in Devon and 0.85% in East Anglia.

Lyon Chirurgical

48:129-256 (Feb.-March) 1953. **Partial Index**

*Late Complementary Adrenalectomy in Sympathectomized Patients with Thromboangiitis (Five Cases, One with Cortical Adenoma). R. Leriche. —p. 129.

*Nonsurgical Treatment of Urogenital Tuberculosis: Present Status of Therapeutic Indications. J. Cibert.—p. 133.

Results of Surgical Treatment of Lung Cancer. P. Santy and M Bérard. —p. 149.

Surgical Treatment of Nontraumatic Intracerebral Hemorrhage. P. Wertheimer and G. Allègre.—p. 172.

Late Complementary Adrenalectomy in Thromboangiitis After Sympathectomy.—Patients with thromboangiitis may have persistent edema of the foot with ulceration and pain in the toes after lumbar sympathectomy. Amputation in such cases is not inevitable. Complete regression of symptoms can often be secured by a complementary perifemoral sympathectomy if the artery is permeable for an average of from 8 to 12 cm. or by an arteriectomy if it is obliterated. A low sympathectomy can also be supplemented by a high one, and vice versa. The vasodilatation following these procedures corrects the residual ischemia. Similar benefits may be derived from adrenalectomy even after a lapse of years. Leriche reports cases in which the disease was arrested and amputation was avoided by adrenalectomy performed some years after the first appearance of symptoms, even after one limb had already been sacrificed. Microscopic adrenal adenomas are often seen in patients with thromboangiitis, and on one occasion adrenalectomy resulted in the removal of a tumor the size of a walnut. Leriche's 33 years of experience and the records of more than 150 adrenalectomies lead him to consider it the best possible operation for patients with thromboangiitis.

Nonsurgical Treatment of Urogenital Tuberculosis.—The value of antibiotics in the treatment of tuberculous genital lesions in men is limited and their use should be restricted to the severe forms of the disease that often appear later. The possible coexistence of an undetectable, medically curable renal lesion provides the only exception to this rule. Administration of *p*-aminosalicylic acid alone, reserving streptomycin for use in subsequent emergencies, might prove effective in such cases and would eliminate the dangers resulting from drug resistance. Established renal lesions cannot, as a rule, be cured by antibiotic therapy, but when the lesion is slight and renal function is normal or nearly so, nephrectomy can safely be postponed in the hope that the disease may be arrested and rendered quiescent. Some patients will be able to resume an active life with little or no discomfort after a rest period; others may require nephrectomy later if antibiotic treatment proves ineffective or a relapse occurs. Progressive renal destruction, however, may make postponement dangerous in patients who will not accept continued urological observation. Cystitis is a strong indication for surgical intervention. Nephrectomy should not be delayed when the renal lesions are severe or even moderate, because such lesions cannot be cured by medical means and to postpone the operation is to risk a poor result. Antibiotic treatment of bilateral tuberculosis, though merely palliative, has a marked effect on the general condition, results in the disappearance of certain forms of hematuria, clears the urine, and provides at least temporary relief from cystitis of recent origin. The chief value of the antibiotics in urogenital tuberculosis lies in the fact that they have extended the scope of surgical treatment and made it safer and more effective.

Medical Journal of Australia, Sydney

1:209-244 (Feb. 14) 1953

The World Food Problem—Technical or Social? S. M. Wadham.—p. 209.

Upper Abdominal Pain in General Practice. C. Yeatman.—p. 216.

Infection of Maxilla in Relation to Maxillary Sinusitis. W. E. Fleming. —p. 219.

Agranular Adenoma (So-Called "Foetal Cell" Adenoma) of Pituitary Gland: Review of Literature. I. J. Hunter.—p. 220.

Minerva Chirurgica, Turin

8:37-88 (Jan. 31) 1953. **Partial Index**

*Electrocardiographic Changes During Angiocardiography. P. F. Angelino, A. Actis-Dato and V. Levi.—p. 37.

Arterial Circulation of Hand: Anatomic and Surgical Studies. L. L. Bracco and G. Ferrero.—p. 43.

Isolated Tuberculosis of Sternocleidomastoid Muscle: One Case. N. Masera and G. Bianchera.—p. 58.

*Experimental Studies on Use of Streptodornase, Streptokinase, and Pancreatic Pyolytic and Fibrinolytic Ferments in Prophylaxis of Postoperative Peritoneal Adhesions. C. Cavallini-Francolini and E Lodigiani. —p. 65.

Electrocardiographic Changes During Angiocardiography.—The authors studied the changes occurring in electrocardiograms taken during angiocardiography in 28 patients with acquired heart disease, 47 with congenital heart disease (31 of these with cyanosis), and 5 with pulmonary neoplasms. Angiocardiography with the injection of 1.2 to 1.5 cc. of contrast medium (a fluid containing 70% iodine) per kilogram of body weight was almost always performed with the patient under local anesthesia. In only nine children was general anesthesia necessary. Transitory bradycardia was seen in patients with acquired and congenital heart disease, but it lasted longer in those with congenital heart disease in whom cyanosis was also present. In patients with acquired lesions of the mitral valve, it was followed by normalization of the heart rhythm and then often transitory tachycardia. Tachycardia followed the injection of the contrast medium in patients with sinus rhythm and total arrhythmia and lasted as long as 5 to 10 minutes. Transitory extrasystoles appeared 10 to 20 seconds after the injection in four patients with mitral stenosis and sinus rhythm. There were never changes in the QT interval and the electric atrioventricular conduction. In one-third of the patients with congenital heart disease and one-half of those with acquired heart disease there was a reduction in the voltage of the QRS complex in the three leads, but this also disappeared in a few minutes. The T wave showed reduction of voltage, leveling, and inversion in patients with acquired heart disease and especially in those with mitral stenosis. These changes were less evident in patients with congenital heart disease, and the authors attribute them to the anoxia produced in the myocardium immediately after the injection of the contrast medium. Clinical observations of the patients during this phase of coronary insufficiency as indicated by the electrocardiogram revealed precordial distress and difficult breathing. To avoid these phenomena, oxygen was given to some patients before, during, and after angiocardiography was performed. To other patients morphine, atropine, and sparteine were given before hand, but these drugs did not influence the electrocardiographic tracings. In the children who were under general anesthesia the T wave tracings did not change significantly, perhaps because of the reflex nature of these phenomena. Also the tracings did not vary greatly in six cases in which a second angiocardiogram was made several days later by

catheterization of the heart with smaller doses of contrast medium injected at a much lower speed. Thus these changes seem to be correlated with the size of the dose of opaque medium, the speed with which it is injected, and its high concentration. The principal factor, according to the authors, is the myocardial ischemia that occurs immediately after the injection and is caused by chemical action of the fluid on the endocardium and the coronary vessels, a reflex coronary spasm, and the arrested flow of blood through the myocardium. Special caution is suggested when angiocardiography is done in patients in whom previous electrocardiograms reveal coronary insufficiency.

Prophylaxis of Intestinal Adhesions with Streptokinase, Streptodornase, and Pancreatic Enzymes.—Experiments were made in 30 guinea pigs to study the action of streptokinase, streptodornase, and two pancreatic enzymes (one with fibrinolytic action and the other with lytic action on desoxyribonucleic acid) on postoperative intestinal adhesions. Adhesions were produced in 15 guinea pigs by removing sections of the serous membrane from intestinal loops. Then 20,000 I.U. of streptokinase and 5,000 I.U. of streptodornase were injected in five animals and 40 mg. of the fibrinolytic enzyme and 10 mg. of the lytic enzyme extracted from bovine pancreas in five; five served as controls. Laparotomy performed 20 days later showed that the enzymes had not only failed to prevent the formation of adhesions between the intestine and the parietal peritoneum but had in fact caused the production of more extensive and firmer adhesions than those in the control animals. In addition, the general condition of the treated animals was worse than that of the controls, in which removal of the adhesions was much easier. After the adhesions were removed, the controls were given 5 cc. of isotonic sodium chloride solution, whereas the pancreatic enzymes were injected again in five of the others. Three of these died of peritonitis. After 20 days the adhesions were definitely less extensive, less numerous, and less firm in the controls. In a second series of experiments peritonitis was provoked in 15 guinea pigs by repeated perforation of the large intestine with a needle. After three days a dose of streptokinase and streptodornase was injected in five of them, pancreatic ferments in five, and isotonic sodium chloride solution in four that were to serve as controls (one of them had died of peritonitis). Laparotomy 20 days later revealed in this group also larger and firmer adhesions in the animals treated with the enzymes. The study was continued following the procedure used for the animals of the first group, and the same results were obtained. Not only had the enzymes not prevented the onset of adhesions but, according to the authors, they had enhanced the process of their formation.

Presse Médicale, Paris

61:285-304 (Feb. 28) 1953. **Partial Index**

*Procaine Hydrochloride Esterase in Hepatic Disorders; Diagnostic and Prognostic Significance of Repeated Determinations Made at Short Intervals. R. Hazard and A. Lafitte.—p. 285.
Study of Bone and Serum Proteases; Experimental Hyperparathyroidism and Its Repercussions on Gastric Mucosa and Serum Protease Ratio. E. Rutishauser and G. Majno.—p. 286.
Regression of Anatomic Lesions of Experimental Tuberculosis in Guinea Pigs Treated with Isoniazid. J. Baudot, Delaude, Moreau and Serena. —p. 288.

Procaine Hydrochloride Esterase Test in Hepatic Disorders.—In a previous paper one of the authors demonstrated that human serum contains an esterase of hepatic origin that is capable of hydrolyzing procaine hydrochloride into *p*-aminobenzoic acid and diethylamino ethanol. The rate and extent of this hydrolysis can be measured by determining colorimetrically, at intervals, the amount of free *p*-aminobenzoic acid in the serum. In normal persons hydrolysis proceeds rapidly, while in patients with liver insufficiency it takes place more slowly. The rate of hydrolysis can, therefore, be used as a test of liver function. To provide a basis for the detection of slight variations in the rate of hydrolysis, the authors established a normal procaine hydrolysis curve by determining the percentage of procaine hydrolyzed at five minute intervals and plotting these values on a graph. They found that in normal subjects 45% of the procaine is hydrolized in 5 minutes, 70% in 10 minutes, 85% in 15 minutes, 95% in 20 minutes, and 100% in 30 minutes. In patients with slight liver insufficiency the rate of hydrolysis was slightly subnormal throughout the test, or was subnormal only during the first 15 or 20 minutes and then became normal. In patients with moderate liver insufficiency, there was 80% or less hydrolysis after 30 minutes (moderately subnormal curve), and in patients with severe insufficiency the curve tended to flatten out at levels as low as 10 or 20%. Repeated tests during the course of liver disease reflected the severity of the liver damage and seemed to have prognostic value. Of 34 patients with progressive alcoholic cirrhosis, 28 had markedly subnormal procaine hydrolysis curves, and the remaining 6 had moderately subnormal curves. Of seven patients with cancer of the liver, three had considerably subnormal curves, two had moderately or slightly subnormal curves, and two had normal curves. Six of seven patients with severe virus hepatitis had markedly subnormal curves. The curves of seven patients with severe jaundice were markedly subnormal in three cases, moderately subnormal in two, slightly subnormal in one, and normal in one. Of eight patients with stones in the common bile duct, four showed normal curves, three slightly subnormal curves, and one a markedly subnormal curve. In certain patients this test for procaine hydrochloride esterase gave subnormal results when other liver function tests, including galactose tolerance, thymol turbidity, cephalin-cholesterol flocculation, cadmium, and prothrombin tests still showed no evidence of liver damage. As a result of these studies the authors consider the procaine hydrochloride esterase test as a reliable measure of the enzymatic function of the liver.

Schweizerische medizinische Wochenschrift, Basel

83:227-250 (March 7) 1953. **Partial Index**

Effect of Duration of Storage on Compatibility of Preserved Blood. F. David and E. P. Billeter.—p. 234.
*Lymphocytic Encephalomeningitis with Involvement of Other Organs. O. Schildknecht.—p. 236.
*Buffering of Gastric Juice in Study for Mycobacterium Tuberculosis. W. Roth and H. Birkhäuser.—p. 240.

Lymphocytic Encephalomeningitis.—The epidemic occurrence in 1950 of benign lymphocytic encephalomeningitis in 10 patients between the ages of 10 and 55 is reported. The disease had a biphasic course in 8 of the 10 patients, including some with the acute type as well as those with the protracted type. The interval between the two phases varied from one week to eight weeks. In the remaining two patients with the acute type of the disease, its course was monophasic. In two patients the disease started with stomatitis. One patient had three bouts of fever, the last being associated with a rash. All patients complained of some form of headache. Examination of the cerebrospinal fluid revealed a pronounced lymphocytic reaction, with 38 to 2,632 cells per cubic millimeter in seven patients. In one patient there were 248 polymorphonuclear cells in a total of 336 cells per cubic millimeter, and in another patient there were 8 polymorphonuclear cells in a total of 12 cells per cubic millimeter. The cerebrospinal fluid was normal in one patient. The protein content varied, and its maximum value was 63.8 mg. per 100 cc. Involvement of the liver, sometimes pronounced and sometimes mild, was demonstrated by the galactose tolerance test. The liver was tender on palpation in two patients. Icterus was absent in all patients. Reactions to the Takata test were negative. A rubeola-like rash, always occurring in the second phase of the disease, was observed in five patients. Nephritic urine findings occurred in one patient. This was regarded as a generalized virus infection, with primary involvement of the meninges and the nervous system and less pronounced involvement of the liver, skin, and kidneys. Brucellosis, leptospirosis, Q fever, and syphilis could be excluded by serologic examinations. Differential diagnosis from poliomyelitis proved to be difficult. The similarity of the condition in the author's patients to that in patients with epidemic lymphocytic encephalomeningitis reported on in the literature is emphasized,

Buffering of Gastric Juice for Detection of Tubercle Bacilli.—Kabler and Lundholm's technique of buffering specimens of gastric juices with crystalline disodium phosphate before examining them for tubercle bacilli was tested by the authors in experiments on guinea pigs. Only 110 of 395 specimens examined showed tubercle bacilli. Of these 110 specimens, 55 showed bacilli whether the buffer was added or not, 44 showed bacilli only when the buffer was added, and 11 showed bacilli only when the buffer was not added. Of 78 specimens examined on the same day on which they were collected, 24 (30.8%) showed bacilli when buffered and 24 (30.8%) showed bacilli when not buffered. Of 237 specimens examined one to two days after their collection, 58 (24.5%) showed bacilli with the buffer, while only 34 (14.3%) did so without the buffer. Of 80 specimens examined more than two days after their collection, 17 (21.2%) gave positive results with the buffer, while only 8 (10%) did so without it. Significantly more positive results thus were obtained from specimens of gastric juice to which the phosphate buffer had been added, provided that the examination of the specimens was delayed for at least one day. Such a delay can hardly be avoided for technical reasons, and consequently buffering is indicated in all cases. The faot that bacilli were found only without the addition of the buffer in 11 specimens may have been due to unequal distribution of small numbers of bacilli in the gastric specimens.

Semaine des Hôpitaux de Paris

29:827-888 (March 10) 1953. **Partial Index**

Clinical Applications and Critical Study of I^{131} Thyroid Test. Guy-Laroche, L. Mallet and J. Trémolières.—p. 827.
*Effect of Isoniazid on Pulmonary Tuberculosis: Study of 100 Cases. P. Véran.—p. 834.
Cardiovascular Syndrome in Mass Poisoning by Bread. G. Giraud, H. Latour and G. Pitot.—p. 839.
The Skeleton in Herpes Zoster. L. Isemein and A. Fournier.—p. 845.

Effect of Isoniazid on Pulmonary Tuberculosis.—Isoniazid alone was given to 100 patients with pulmonary tuberculosis, more than half of whom had previously received substantial doses of streptomycin. Collapse therapy was used in connection with isoniazid in 12% of the cases. Treatment lasted for from 10 to 12 weeks in most cases, but in 20% it was continued for from 4 to 5 months. The dose, which consisted of 5 mg. per kilogram of body weight, given in three divided doses daily, increased as the patient gained weight. The drug had a pronounced effect on functional and general symptoms regardless of the age or sex of the patient. Cough was benefited in 67% of the patients, being suppressed in 17%, decreased rapidly in 27%, and decreased slowly in 20%. Expectoration was quantitatively reduced in 60% (suppressed in 18%). Appetite increased rapidly even in patients with long-standing anorexia; in 55% the appetite remained improved after discontinuance of the drug. Gains in weight of from 1 to 6 kg. were observed within a month in 66% of the patients. This increase in weight continued for two months in 52% and to a lesser degree after cessation of treatment in 44%. Improvement in the general condition, with euphoria and disappearance of the depression characteristic of tuberculous patients, was rapid, occurring in two-thirds of those who were gravely ill, but was permanent in fewer than half. Fever was relieved in certain patients who had had elevated temperatures for several months; return of the temperature to normal levels was secured after one month in 86% and after two months in 92%. The effect of isoniazid on the radiological signs was much less marked, recent lesions in all forms of tuberculosis showing the greatest improvement. Cavities were rarely healed, although some were reduced in size. The improvement produced by isoniazid made some patients eligible for collapse therapy, while in others it was possible to defer such treatment advantageously. Tolerance for the drug was generally good; cochlear and vestibular functions did not seem to be impaired and there were no significant hepatic or renal disturbances. The blood formula, however, should be watched, and constant neurological surveillance must be maintained, because epileptic seizures may occasionally be provoked. Isoniazid should not be given to patients with epilepsy.

Ugeskrift for Laeger, Copenhagen

115:231-266 (Feb. 12) 1953. **Partial Index**

Operative Treatment of Hypospadias. P. Fogh-Andersen.—p. 231.
Operative Treatment of Hallux Valgus. H. B. Mygind.—p. 236.
*Hashimoto's Struma with Report of Two Cases. V. Olesen.—p. 241.
Convulsions During General Anesthesia. S. Jørgensen, O. Secher and E. W. Andersen.—p. 245.

Hashimoto's Struma.—Hashimoto's struma is an uncommon disease that affects women in middle life predominantly. It may be seen in all age groups, though seldom in patients under 30. It does not occur particularly in goiter areas. The cause is unknown. The subjective symptoms are few and vague, and the goiter has usually been present for from months to years before medical advice is sought. Differential diagnosis with regard to cancer is important. Struma lymphomatosa is characterized by its cartilaginous consistency and the fact that it embraces isthmus and both lobes and is well defined and freely mobile; there are no signs of involvement of blood vessels or nerves or of regional glandular inflammation or metastases. A tendency to myxedema is present, and the sedimentation rate is generally slightly increased. Some persons with mild forms are believed to recover spontaneously. Olesen says that many patients do not require treatment but they should be closely observed for malignancy or symptoms of compression. Operative treatment, when diagnosis is certain, consists of subtotal thyroidectomy. The prognosis is good. Postoperative complications are infrequent. Tendency to recurrence after operation is slight. Recurrences that have been reported are due to the removal of only one lobe. Recovery after roentgen or radium treatment has been reported, but the increased fibrosis that follows may perhaps increase the danger of compression of the trachea. In the two cases described the diagnosis was based on histological findings after thyroidectomy because of suspected malignancy. Postoperative myxedema was controlled by medical treatment.

Zentralblatt für Gynäkologie, Leipzig

75:1-48 (No. 1) 1953. **Partial Index**

Mechanism of Onset of Labor. F. Hoff and R. Bayer.—p. 1.
*Further Observations on Isoimmunization During Pregnancy. H. J. Pettenkofer and M. Petry.—p. 12.
Placental Hormones in the Chicken Feeding Test. E. Haupt.—p. 21.

Isoimmunization During Pregnancy.—Between January, 1951, and May, 1952, blood specimens from 1,763 unselected pregnant women and 3,423 puerperal women were examined at the serological department of the Robert Koch Institute. Forty-three or 2.44% of the pregnant women and 110 or 3.21% of the puerperal women were found to have antibodies to the less common blood group factors. The slightly smaller incidence of such antibodies in the pregnant women is ascribed to the fact that the serum of many of the pregnant women was examined during the early months of pregnancy, when antibodies had not as yet developed. Signs of hemolytic disease of the newborn (erythroblastosis) were observed in 29 of the infants of the 3,423 pregnant women (0.85%). Five of the 29 infants were stillborn. These 5 and 2 other infants showed the signs of hydrops fetalis; 17 had icterus gravis neonatorum; and 9 had anemia neonatorum. A table listing the specificity of the antibodies found in the 153 (43 pregnant and 110 puerperal) women shows that the Le^a antibody was the most frequent, but none of the women with this antibody had babies with erythroblastosis fetalis. Twenty-two cases of erythroblastosis developed following immunization with the D factor, 4 cases following immunization against the A factor and one case each following immunization to the C and E factors. Five of the 29 mothers with erythroblastotic infants were Rh-positive. It was found that in mothers with the blood group O, isoimmunization during pregnancy is rare, but mothers with the blood group A have a tendency to form antibodies against the erythrocytes of their infants. In 483 unselected cases of birth of healthy infants, there were 62.16% multiparas among the Rh-compatible mother-child combinations; whereas in the group of Rh-negative mothers with Rh-positive children, only 41.67% were multiparas. This difference of 20.49% is statistically significant. Measures that should be taken in case of isoimmunization during pregnancy are discussed.

BOOK REVIEWS

Fundamentals of Clinical Orthopedics. By Peter A. Casagrande, M.D., Attending Orthopedist at Chronic Disease Research Institute of University of Buffalo, Buffalo, New York, and Harold M. Frost, Jr., M.D. Forewords by Joseph S. Barr, M.D., and Frank N. Potts, M.D. Special contributors: Dr. Bert P. Austin, et al. Additional contributors: Mr. Eric Balke, et al. Cloth. $18.50. Pp. 582, with 390 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1953.

This is a well-written and well-illustrated text on clinical orthopedics. The divisions permit easy reading, and grouping of the subjects has been extremely well done. Practically no orthopedic problem has been omitted. The manner of presentation is logical in that the clinical aspects of the various orthopedic disabilities are discussed in regard to etiology, physiology, and anatomy. Clinical description is excellent. Treatment has been deliberately minimized; all of the various treatments for the many conditions would have required another volume. The drawings explaining the mechanism of pulls in fractures, while not extremely new, give a very clear-cut and easily understood description of muscle pull. A notable feature is elimination, as far as possible, of proper names of diseases, signs, and operations. Rather than the proper name, adequate anatomic or physiological terms have been used, and this is of greater value than a group of proper names to memorize. The book is so detailed that it is beyond the use of the medical student, except as a very excellent reference book. For an orthopedic resident, however, it should be very valuable. It would also be a definite contribution to every orthopedic library. The only unfavorable feature is the large size of the book. The printing is excellent, and the size of type makes reading easy. The authors should be complimented for their extensive work in condensing so much material into one volume.

John Abernethy: A Biography. By John L. Thornton, A.L.A., Librarian, St. Bartholomew's Hospital Medical College, West Smithfield, London, E.C.1. Cloth. 25/-. Pp. 184, with 14 illustrations. Distributed by Simpkin Marshall Ltd., London, 1953.

The principal sources of information on John Abernethy are found in the "Memoirs of John Abernethy" by George Macilwain, one of his pupils. Although the book is factually accurate, it is somewhat one-sided in the interpretation of the illusive character of Abernethy, probably because the author had not achieved any degree of intimacy with his teacher or his family. The present biography is based on a thorough study of all available material and sheds new light on the controversial personality of Abernethy, as well as on his contemporaries and their relationships with one another.

Abernethy was born in 1764 and lived during the reigns of Charles III and Charles IV. The period was one of intense activity in science and medicine, and young Abernethy took advantage of the facilities offered by the most prominent teachers in London. They were Maclaurin, Sir William Blizard at the London Hospital, Percivall Pott at St. Bartholomew's Hospital, Sir Charles Blicke, and the great John Hunter. Abernethy was probably most influenced by Hunter, so that in his own activities he followed his master's philosophical theories. Abernethy was first to ligate the external iliac artery for aneurysm. He also ligated the common carotid for hemorrhage, and improved treatment of lumbar abscesses by incision. He believed that local diseases are either of constitutional origin or are due to digestive disturbances. Abernethy was the founder of the school of British surgery based on physiology rather than anatomy, and is considered the first great English surgeon of the last century to treat his patients by expectant means rather than by operation.

As to the eccentricities and rudeness of Abernethy in his relations to his patients, the opinion of the Duke of Sussex, quoted by the author, probably best describes it: "Mr. Abernethy was one of those pupils of John Hunter who appears the most completely to have caught the bold and philosophical spirit of his great master. He was the author of various works and memoirs upon physiological and anatomical or surgical subjects. As a lecturer, he was not less distinguished than as an author. He enjoyed more than an ordinary share of public favor in the practice of his profession; and, though not a little remarkable for the eccentricities of his manner and an affected roughness in his intercourse with his ordinary patients, he was generally kind and courteous in those cases which required the full exercise of his skill and knowledge, and also liberal in the extreme when the infliction of poverty was superadded to those of disease."

The biography should be of interest to physicians not only because of the contributions of Abernethy but also because of the intimate knowledge that has enabled the author to sketch a number of personalities associated with St. Bartholomew's Hospital and with English surgery of the period.

Collegiate Education for Nursing. By Margaret Bridgman. Cloth. $2.50. Pp. 205. Russell Sage Foundation, 505 Park Ave., New York 22, 1953.

This book is important to all physicians, nurses, and hospital administrators who are concerned about the future education of nurses. The book outlines in brief the situation in nursing service available today. It shows that there are actually more graduate nurses currently working than at any previous time. At the same time it points out the weaknesses in the present system for education of nurses and recommends that experimentation and research in nursing education be developed on the collegiate level. The book is really a plea for a change in the outmoded and stereotyped teaching methods of the past. The author states that this book "is offered as a basis of discussion in the hope that, with other current studies by many groups and individuals who are working on the problem, it may help to clarify issues and bring about a concensus on principles leading to satisfactory long-range plans for action."

Hormonal and Neurogenic Cardiovascular Disorders: Endocrine and Neuro-Endocrine Factors in Pathogenesis and Treatment. By Wilhelm Raab, M.D., F.A.C.P., F.A.C.C., Professor of Experimental Medicine, University of Vermont, Burlington. Cloth. $15. Pp. 722, with 88 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1953.

The author's basic thesis stresses the importance, in the production of cardiovascular disease, of the release of the catecholamines, epinephrine, and arterenol into the myocardium and the vascular musculature of the body. He presents many cogent arguments in support of this thesis and attempts, more or less successfully, to show that the actions of such amines on cardiac and vascular tissue are capable of inducing both the functional and structural alterations seen clinically.

On page 525, the author says, "Some time-honored but out-dated mechanistic views which interpret cardiovascular functional and structural changes solely in terms of coronary flow and of hemodynamic factors are no longer tenable. They must be revised in the light of present-day knowledge of ubiquitous neuroendocrine and endocrine biochemical influences upon cardiovascular tissue metabolism and of their interplay. Teleological auxiliary hypotheses are becoming increasingly superfluous and should be discarded." He points out that much progress has been made recently in the treatment of hypertension, angina pectoris, and congestive heart failure by such measures as surgical sympathectomy, antiadrenergic medication, and radiotherapy, along with thyroid inactivation, restriction of dietary sodium, and adrenalectomy. Finally, he expresses the thought that even greater progress in therapy may be expected with the greater understanding of the fundamentally biochemical nature of the common cardiovascular disorders. He suggests that the use of the so-called sympatholytic drugs appears ideal as a nonsurgical method of sympa-

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

thetic inactivation and feels that dihydroergotamine is safe for clinical use and apparently has normalized both the clinical status and the electrocardiogram in patients with angina pectoris. X-ray inhibition of adrenal function for the treatment of angina pectoris yielded improvement in 76% of 200 patients, 31% of whom were almost entirely relieved of their symptoms for an average of three and one-half years.

The student of cardiovascular disorders, both clinical and experimental, should spend much time studying Raab's postulates. The volume is well organized, with many cross references in the text as well as an unusually large list of other references. The physical make-up of the volume is excellent. It is well bound, and the type is clear and easily read. This book can be recommended without reservation.

Der intermediäre Stoffwechsel. Von Dr. Dr. Konrad Lang, o.ö. Professor der physiologischen Chemie, Direktor des physiolog.-chem. Instituts der Universität Mainz. Lehrbuch der Physiologie in zusammenhängenden Einzeldarstellungen. Unter Mitarbeit einer Reihe von Fachmännern. Herausgegeben von Wilhelm Trendelenburg und Erich Schütz. Cloth. 39.60 marks. Pp. 423, with 29 illustrations. Springer-Verlag, Reichpietschufer 20, Berlin W. 35 (West-Berlin); Neuenheimer Landstrasse 24, Heidelberg; Göttingen, 1952.

In the preface, Dr. Lang claims that this is the only recent monograph in German on intermediary metabolism. In consideration of this fact, he treats both biochemical and physiological aspects of the intermediary metabolism of higher animals, is particularly careful with his nomenclature and style, includes quantitative data where possible, covers the literature with unusual thoroughness, and includes extensive indexes. This treatment will allow the work to be used both as a textbook and as a reference work. The 20 pages of literature citations will appeal to English-speaking biochemists and physiologists, since several recent monographs in English are listed. Dr. Lang states that his references are complete through June 1, 1952. American and British publications are cited as often as continental works. Wherever possible the older literature is disposed of by citation of reviews, so that the reader interested in pursuing a point will be able to find the most information in the least time.

The material includes chapters on methods of research, antimetabolites, biological oxidation, carbohydrates, alcohols and aldehydes, bases, proteins and amino acids, fats and lipids, pyrroles, nucleotides and related compounds, metabolism of aromatic substances, and localization of metabolic processes in cells. Paper, printing, and binding are of good quality.

Ocular Therapeutics. By William J. Harrison, M.D., Phar.D., F.A.C.S., Associate Professor in Ophthalmology, Jefferson Medical College, Philadelphia. Second edition. Cloth. $6.50. Pp. 282. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1953.

Like its predecessor, the second edition of this stout pocket manual on ocular therapeutics provides instructive, useful information for busy, practicing ophthalmolgists. New data have been added on anticoagulants, ophthalmic uses of cortisone and corticotropin, antibiotics and the sulfonamides, isotonic solutions and buffered solutions, and vitamins. The language is clear, concise, and colloquial, and it is always very much to the point. This book is recommended to younger clinicians.

Praktische Arbeitsphysiologie. Von Prof. Dr. Gunther Lehmann, Direktor des Max-Planck-Instituts für Arbeitsphysiologie Dortmund. Cloth. 33 marks. Pp. 355, with 145 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A., Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1953.

This book takes up problems of work output in industry as related to the functions of the human body. This branch of physiology is an essential part of the basis for occupational hygiene. An introductory chapter classifies types of work according to the relative importance of the physical and the psychological elements involved. Subsequent chapters deal with muscular work, conditions for muscular efficiency (problems of posture and fatigue), energetics (metabolism), the rational planning of machinery and optimum working conditions, environmental factors including radiation and ventilation, composition and pressure of the air, problems relating to the ear and eye, relation of nutrition to work output, evaluating and encouraging efficiency, and optimum duration of work periods.

There is a glossary and an index, and bibliographic references follow each chapter. In a few places (e. g., page 300) the author lapses into the complex sentence structure characteristic of some German textbooks, but generally his style is simple and direct, and the subject matter is made concrete by quantitative information and some good illustrations. This book will be a valuable addition to every library devoted to industrial medicine and occupational hygiene.

Grundzüge der physikalischen Therapie der Hals-, Nasen- und Ohrenkrankheiten. Herausgegeben von Dozent Dr. A. J. Cemach. Unter Mitarbeit von Dozent Dr. O. Novotny, Dozent Dr. L. Psenner, und Primarius, Dr. A. Riccabona. Teil II: Die Röntgentherapie in der Oto-Rhino-Laryngologie. Von Dozent Dr. O. Novotny, 1. Assistent der I. Hals-, Nasen-Ohrenklinik Wien, und Dozent Dr. L. Psenner, 1. Assistent am Zentral-Röntgen-Institut, Wien. Band IV, Wiener Beiträge zur Hals-, Nasen- und Ohrenheilkunde begründet von Prof. Dr. Camillo Wiethe. Paper. 15 marks. Pp. 105, with 22 illustrations. Wilhelm Maudrich, Alserstr. 19, Vienna VIII/65, 1953.

This paper-bound volume is the second of a set of three dealing with physical methods of treatment in diseases of the ear, nose, and throat. The other two volumes will deal with the therapeutic use of light, electricity, radium, and inhalations; the present volume deals solely with roentgen rays. It is divided into two parts, the first devoted to general considerations of technique and dosage and the second to particular consideration of the outer ear, middle ear, nose (with accessory sinuses and nasopharynx), mouth, pharynx, larynx, and esophagus. The author presents his subject in succinct, concrete form. Illustrations and statistical data supplement the text. The bibliography of 48 references is confined to European publications, but the text reflects current American thinking as well. The book is recommended to those who read German.

Pédiatrie. Par Robert Debré et Marcel Lelong. Avec la collaboration de: Stéphane Thieffry et Jean Rivron, et al. Collection médico-chirurgicale à révision annuelle. Directeur général: Pasteur Vallery-Radot. Secrétaire général: Jean Hamburger. In 2 volumes. Loose-leaf. Cloth. 14.500 francs. Pp. 1154; 1159-2234, with 388 illustrations. Editions médicales Flammarion, 22 rue de Vaugirard, Paris-VI^e, 1952.

An outstanding attribute of these volumes is the loose-leaf form that permits the addition of supplementary material. These books might well fill the gap between standard textbooks, which require frequent revision, and the more extensive and expensive works on pediatrics, which are difficult to keep up-to-date. The volumes have adequate, technically superior illustrations. The material is well organized, with useful cross references.

Apparently much of the world literature was not available to the authors, as a considerable amount of the material is not up-to-date, and the bibliographies at the end of the chapters are made up primarily of other textual material. Many outstanding contributions have been made by French pediatricians and by the authors, but these two volumes do not represent current pediatric knowledge. This book may be intended for the use of general practitioners in France, but the content would not be suitable for this purpose in the United States.

Artificial Light and Photography: A Treatise on Artificial Light Sources and Their Application in Photography. By G. D. Rieck and L. H. Verbeek. With foreword by A. L. M. Sowerby, B.A., M.Sc., F.R.P.S. English translation of this work is by G. Ducloux-Sutton (England). Cloth. $8.25. Pp. 326, with illustrations. [Elsevier Press, Inc., 402 Lovett Blvd., Houston 6; 155 E. 82nd St., New York]; N. V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands, 1952.

The subject of artificial light and its application to photography is very well covered by the authors. Various types of artificial light sources, such as incandescent and fluorescent light, gas discharge tubes, and flash bulbs are discussed in detail. Although sections of the book are highly technical, there are many examples of lighting problems encountered by the advanced amateur as well as by the professional photographer. Only a page and a half is devoted to a general discussion of clinical photography. The over-all format of the book is excellent. The illustrations, four of which are in color, are outstanding. The basic material presented will be valuable to clinical photographers, professional and commercial photographers, and the advanced amateur.

QUERIES AND MINOR NOTES

THE PREVENTION OF KIDNEY STONES

To the Editor:—*A patient of mine, aged 47, has had kidney stones for 20 years. He has had many cystoscopic examinations and has had stones removed from both kidneys several times. He passes small stones every day. He has tried every diet obtainable and about every medicament recommended. He read an article about some colloid that was used for such a condition and asked me to find out about it.*

Wallace R. Smith, M.D., Grand Marais, Minn.

Answer.—The article read by this patient probably referred to treatment of urinary calculi by subcutaneous injections of hyaluronidase. Butt and Hauser (*New England J. Med.* **246:**604, 1952) stated that such injections increase colloidal activity of the urine and thereby prevent crystalloids from coalescing and forming a stone. The dose and frequency of injections are determined by noting the ability of the drug to convert macroscopically cloudy urine into macroscopically clear urine. It appears that 150 to 900 turbidity reducing units injected at 24 to 72 hour intervals are necessary to keep the urine clear. Helsby and co-workers (*J. Urol.* **69:**354, 1953) noted that injections of hyaluronidase failed to prevent formation of stone about a foreign body placed in the bladder of rats. They hasten to point out, however, that their experiments do not refute the claim that hyaluronidase prevents formation of stone in humans and suggest that this notion will have to be substantiated by further observations. Sufficient time has not elapsed to permit corroboration of the efficacy of this form of treatment by other workers, so that any opinion given at this time is premature.

Prevention of the recurrence of calculi requires thorough investigation by a urologist. Determinations of the calcium, phosphate, phosphatase, and uric acid levels, carbon dioxide combining power, and chloride content of the blood may be necessary in a search for the cause of calculus formation. The chemical nature of stones that have been passed or removed surgically must be determined, and it may be necessary to examine the urine for cystine crystals. Urographic studies and bacteriological examinations of the urine are essential. These tests may indicate the cause of the stones and suggest a definitive form of treatment. Thus, hypercalcemia, hypophosphatemia, hypercalciuria, and hyperphosphaturia indicate hyperparathyroidism. The diagnosis can be corroborated by other studies, and treatment consists of excision of an adenoma of the parathyroid gland. Hyperuricemia may indicate that the calculi are composed of uric acid, although in the majority of patients with uric acid calculi the uric acid content of the blood is normal. If analysis of the calculi shows the presence of uric acid, a low purine, alkaline-ash diet is indicated; in addition, sodium bicarbonate is prescribed in an effort to maintain the urine constantly alkaline, to take advantage of the increased solubility of uric acid in an alkaline medium. Hyperchloremia and acidosis may indicate deficient formation of ammonia by the kidney, resulting in excretion of fixed base and formation of calcium stones. Therapy consists of an alkaline-ash diet and the administration of sodium bicarbonate. If analysis of the stone indicates cystine or if cystinuria is found, a low sulfur, alkaline-ash diet and use of sodium bicarbonate are prescribed to keep the urine intensely alkaline and thereby take advantage of the increased solubility of cystine in an alkaline medium. Urographic studies may indicate the need for pyelolithotomy, nephrolithotomy, excision of a calix, a plastic procedure, or nephrectomy.

If a causative factor cannot be discovered, specific treatment must be guided largely by analysis of the stone. A treatment commonly employed in management of calcium stones is a low calcium diet and acidification of the urine by means of an acid-ash diet and administration of ammonium chloride or ammonium nitrate. The effectiveness of this therapy is distinctly limited. The most satisfactory treatment employed for calcium phosphate stones consists of measures directed to reducing the urinary excretion of phosphorus. A diet low in calcium and phosphorus along with 80 to 180 cc. of aluminum carbonate gel (Basaljel) in divided doses is prescribed. The aluminum carbonate gel combines with the phosphate ion in the bowel to form a highly insoluble aluminum phosphate in the intestinal tract, which is entirely excreted as such in the stool. Treatment of calcium oxalate stones is difficult, because an exogenous as well as an endogenous source of oxalate exists and precipitation of such calculi can occur in urine that is either acid or alkaline. The most satisfactory form of therapy consists of a diet low in calcium and oxalate. In addition, experimental evidence suggests that the addition of magnesium trisilicate to the diet is advisable. The diets mentioned above are described by Greene (Urolithiasis, in Conn, H. F.: Current Therapy 1953, Philadelphia, W. B. Saunders Company, 1953, p. 441). Finally, certain general measures are advisable for patients with urinary calculi. A daily urinary output of 2,000 to 3,000 cc. is the most important single factor. There is some evidence that daily administration of vitamin A (50,000 units) and thiamine chloride (3 mg.) is helpful. A determined effort should be made to eradicate injection of the urinary tract with suitable antibacterial agents.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

DIFFICULTY IN TREATING "SIMPLE ANEMIA"

To the Editor:—*I have been having difficulty treating simple anemia. For the past year, remedies that heretofore have helped these patients are failing to give results. Adequate amounts of ferrous sulfate and ascorbic acid do not seem to build up and maintain the hemoglobin and red blood cell levels. Liver extract injections sometimes give temporary improvement, but an exacerbation occurs during treatment with a minimum of two injections of 1 cc. each a week. Vitamin B_{12} given every other day also has failed to produce improvement. Is there anything different in the food available today? Could this situation be due to permeation of the air with residue from the explosion of atomic bombs? Other physicians in this community are having the same difficulty. Suggestions on treatment of these patients will be greatly appreciated.*

M.D., Indiana.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—It may be presumed that the term "simple anemia" refers to the hypochromic, microcytic anemia most commonly associated with a deficiency of iron. Chronic or repeated acute loss of blood is most frequently the cause, although nutritional deficiency and other conditions, such as malignant disease, may complicate the problem. Insufficient data are given on the dosage of iron used, the dietary intake, the cause of the anemia, and the variations observed in the blood cell counts and hemoglobin levels to permit specific answers. The following suggestions may help solve the problem. Administration of large doses of iron is often, and perhaps usually, necessary to maintain normal blood levels. Not less than 1.8 gm. daily of any of the commonly available iron salts, given in divided doses, is desirable. A diet containing generous amounts of protein, vitamins, and iron should be followed. Any possible sources of blood loss should be carefully sought and eliminated, if possible. Of the less common sources, esophageal hiatus hernia, hemorrhoids, malignant lesions, and lesions of the genitourinary tract must be considered. Finally, the blood levels must be determined accurately, with standardized equipment and the greatest care

in technique being used as insurance that variations in the blood values are real and are not due to technical errors. Liver extract and vitamin B_{12} are not specifically indicated in this variety of anemia, although they may enhance the utilization of iron or the nutrient substances necessary for blood building in some persons. It is highly unlikely that the blood of persons other than those in close contact would be affected by atomic bomb explosions.

ANSWER.—There is no possibility that the intermittent presence of radioactive residue from atomic bomb test explosions could have any bearing on anemia. After an atomic bomb explosion, the radioactive particles gradually descend to earth. Detailed and repeated measurements of their radioactivity have been made, and at no time has a level capable of affecting the hematopoietic system been observed. Actually, the amounts of radiation so received would be only a small fraction of the radiation received in a routine fluoroscopic examination.

NERVOUS INDIGESTION

TO THE EDITOR:—*A woman, aged 26, has complained of gas in her abdomen, since 1949. She obtains some relief from belching but obtains more when she passes flatus. Repeated examinations have shown increased peristalsis. Gastrointestinal studies done in 1950 showed a moderate-sized diverticulum of the lesser curvature of the cardiac portion of the stomach, which retained the dye in the 24 hour film. The colon was extremely ptotic. Treatment has consisted of use of antispasmodics and methantheline (Banthine) tablets, correction of constipation, and use of abdominal supports. Could the diverticulum cause these symptoms? What further treatment would you suggest?*

Thomas W. Kredel, M.D., Indiana, Pa.

ANSWER.—Diverticula of the stomach are rather rare. They occur usually at the cardiac end of the stomach on the lesser curvature near the cardia. Usually they do not give rise to symptoms and are found accidentally. These diverticula usually do not retain food and rarely exceed the size of a quarter or of a silver half dollar. The symptoms described, flatulence, gas, and intestinal spasm, are those of nervous indigestion and cannot be attributed to the diverticulum of the stomach. Treatment should consist of a diet restricted in starchy foods, sugar, and leguminous vegetables; nervousness can best be controlled by Pavatrine (β-diethylaminoethyl fluorene-9-carboxylate hydrochloride) with phenobarbital, one tablet after each meal. Constipation may be relieved by a liquid petrolatum preparation reinforced with phenolphthalein.

RECURRENCES OF RHEUMATIC FEVER

TO THE EDITOR:—*What is the accepted procedure in the prevention of recurrences in patients who have had one or more attacks of rheumatic fever?* *M.D., New York.*

ANSWER.—In the light of the pathological findings and the clinical course of rheumatic fever, the disease, in its subclinical episodes, should be regarded as a chronic hypersensitive state in which there is a great tendency to relapse, especially during childhood. Hygienic living conditions, understood as housing, clothing, and nutrition, are of primary importance. The predisposing environmental factors deserve more than casual, general advice. (Traut, E. F.: Rheumatic Diseases: Diagnosis and Treatment, St. Louis, C. V. Mosby Company, 1952, p. 425.) A susceptible person, especially a child, should secure adequate rest and proper food, especially adequate amounts of protein. The patient should be protected against chilling and against contact with patients ill from or convalescing from acute respiratory tract infections. An environment with a warm climate and a low altitude, especially during winter and spring is preferable. A reasonable intake of vitamins, such as are afforded by cod liver oil and citrus fruit, is desirable.

Removal of the palatine tonsils can be recommended in a patient having repeated sore throats, although tonsillectomy is no longer routinely employed as a preventive measure. Vaccines made from hemolytic streptococci or from the throat flora of patients with acute rheumatic fever have been used. Institutionalization of persons susceptible to rheumatic fever may afford proper food, housing, and observation but is detrimental from the epidemiological standpoint; it places persons of like susceptibilities in close contact. Institutions also fail to meet the psychic necessities of childhood. Currently, attempts are being made to prevent infection with hemolytic streptococci and are reportedly successful. Administration of 0.5 gm. of sulfadiazine daily to children and 0.5 gm. twice daily to adults is recommended. More recently, 100,000 units of penicillin given orally daily before breakfast or 800,000 units of penicillin given daily for the first week of each month have been advocated as a means of keeping the pharynx clear of hemolytic streptococci. Administration of these drugs has been continued in such doses up to puberty. Besides the expense and tedium of carrying out such a prophylactic program, questions of its efficiency, expense, and possible harm must be thoughtfully considered. All of these measures take on increased importance the younger the subject and the more recent the evidences of active rheumatism.

ELECTRIC ARC WELDING

TO THE EDITOR:—*At what distance is electric arc welding harmful to a bystander's (not the operator's) eyes in broad daylight and under normal shop conditions?*

Jacob L. Greenberg, M.D., Newark, N. J.

ANSWER.—Within any harmful distance, the duration of exposure may be of greater consideration than the distance itself. Not all ultraviolet emanations from arc welding are the same. The output increases with amperage, which varies enormously. By some investigators, 200 ft. is accepted as a minimal distance for unprotected exposure for workers other than the operator or for bystanders. Regardless of the intensity of surrounding illumination, the output of ultraviolet light remains the same. Since eye damage from ultraviolet rays chiefly is to exterior structures, such as the cornea, the state of surrounding illumination is of no real consequence. On a bright, sunshiny day, the ultraviolet rays of sunshine would be added to those from the arc, but this is of little consequence. Only to a slight extent do ultraviolet rays reach the retina. To that extent, the size of the pupil is of some consequence for a single flash. Since in the inside of a plant the illumination is likely to be lower than on the outside, the size of the pupil may be larger and, consequently, slightly more vulnerable. For practical purposes, workers other than the operator at a distance greater than 50 ft. are ordinarily adjudged not to need eye protection, even though the exposure is continuous. It should be kept in mind that the introduction of protective barriers does not necessarily assure safety, because reflected rays sometimes are injurious.

INFLUENZA VACCINE

TO THE EDITOR:—*Is the routine use of influenza vaccine advisable?* *Chancellor H. Whiting, M.D., Oneida, N. Y.*

ANSWER.—The routine use of influenza vaccine is thought by many not to be advisable except perhaps when an epidemic threatens. Maximum protection from influenza vaccine takes about two weeks to develop and, during an epidemic season, most persons may already have been exposed to the virus prior to preventive inoculation. It is believed that the vaccine offers adequate protection for a relatively short time, probbably only three or four months. Little if any crossing of immunity between known major types of influenza virus has been reported. Therefore, it is necessary to know that the type of virus causing a particular influenza outbreak is contained in the influenza vaccine used to protect against this illness, and a polyvalent vaccine may help do this. Furthermore, there have been reports of sensitivity to the vaccine, so that there may be occasional reactions to this material if it is used routinely. There may be circumstances under which the physician may wish to use the vaccine for individual patients and for groups.

OVERWEIGHT AND LONGEVITY

To the Editor:—*The literature indicates that the longevity of obese persons is considerably less than that of nonobese persons. Are there any studies that indicate that obese persons who have reduced their weight have thereby increased their life expectation and their protection against diabetes and circulatory diseases?* *M.D., Rhode Island.*

Answer.—A mortality study of overweight persons by Dublin and Marks of the Metropolitan Life Insurance Company in 1951 (*Tr. A. Life Insur. M. Dir. America* **35:**235, 1952), showed long range benefit from weight reduction. This study was based on persons who were limited to substandard insurance solely because of their weight. The study covered persons of this kind insured during the years 1925 to 1934 and traced to 1950. The mortality of all overweight persons in the study was significantly higher than that of standard risk persons. Out of this general experience, a separate study was made of those overweight persons who subsequently showed a reduction in weight sufficient to qualify them either for standard insurance or a lower rating than they had been given originally. Among both men and women the death rate after weight reduction was substantially less than that for all of the overweight persons studied. Among the men, the reduction was of the order of one fifth and among the women about one third. While these findings cannot be definitive, they are most significant. This is perhaps the best evidence produced to date that weight control pays and is also the most practical approach now available to the problem of preventing or retarding major degenerative diseases of middle and later life.

PAINFUL TOE

To the Editor:—*A 52-year-old man has had severe pain in the medial aspect of the dorsum of his right big toe for one year. It is most annoying during the night, preventing him from sleeping. No sensory changes or evidence of a lesion of the toe are present. He gives a history of treatment for syphilis 10 years ago. A blood Kahn test gives a positive reaction at 1:4 dilution. Neurological examination shows no abnormality. Division of a portion of the digital nerves to the toe on the dorsum of the foot relieved the pain for a week. The patient is receiving penicillin for his syphilis. Is the pain a manifestation of syphilis? If not, what cause and what treatment are suggested?*

John Clough, M.D., Massena, N. Y.

Answer.—The only lesion of syphilis that is suggested by nocturnal pain in the big toe is a lesion involving the metatarsal or phalangeal bones. If a roentgenogram shows syphilitic periostitis or osteitis, the diagnosis should be obvious. Other possibilities are gout and rheumatoid arthritis. Pertinent laboratory tests for these two diseases, including determination of the blood uric acid level and the corrected erythrocyte sedimentation rate, should be done. A remote possibility would be diabetic neuritis; to exclude this, the urine should be examined for sugar, and a fasting blood sugar level determination should be done. Finally, if no adequate medical cause is found for this complaint, the possibility of anterior metatarsalgia must be considered.

SNAPPING IN JOINTS

To the Editor:—*Please explain the audible snapping that occurs in joints (especially knees) that are otherwise normal. The sound is not accompanied by discomfort and usually appears in persons past the third decade.*

Frederick J. Balsam, M.D., Memphis, Tenn.

Answer.—Audible snapping in joints, especially the knees, that are normal is due to thickening of the synovial membrane folds, loose bodies, or fringes in the joint. This may occur in young adults as well as those in the third decade.

METASTASIS FOLLOWING RADICAL MASTECTOMY

To the Editor:—*A patient had a radical mastectomy for carcinoma of the breast one month ago. The incision is not yet completely healed. The pathological report is medullary carcinoma with metastasis to the axillary lymph nodes. There are no clinical signs of metastasis. Is x-ray therapy indicated for preventing recurrence?* *M.D., Pennsylvania.*

Answer.—Delayed healing after radical mastectomy is usually due to a relatively inadequate blood supply to the skin because of the nature of the operation; however, when advanced carcinoma of the breast is attacked surgically, the tumor can recur locally before healing is complete, and this possibility must be kept in mind. Should any suspicious looking tissue appear in the wound, biopsy is indicated. X-ray therapy would be indicated in this patient not only because of the possibility of persistent local disease but also because metastasis to the axillary lymph nodes has already occurred.

AMEBIC DYSENTERY

To the Editor:—*Twenty-eight years ago, a patient lived in Venezuela for three years and had an attack of amebic dysentery. He was treated there with emetine hydrochloride. Three months ago, he had an acute attack and was ill for several days. He was given emetine hydrochloride for three weeks and then chloroquine phosphate. His stools have been negative for ameba for 8 to 10 weeks. I would like to know whether this is a flare-up of the previous infection or a new infection. Amebic dysentery is rare in this community.*

John R. Thomas, M.D., Corpus Christi, Texas.

Answer.—If this patient was free of ameba, as indicated by repeated stool examinations, and free of symptoms of the condition for 28 years, the present attack would be considered a reinfection. This would represent the consensus of all workers with a large experience in the management of amebiasis.

BOOSTER TETANUS INJECTION

To the Editor:—*Last autumn, a 5½-year-old child had an attack of giant hives associated with transitory faintness. He ate lobster a few days prior to this episode. Otherwise, he has never shown signs of allergy. He should have his booster injection for tetanus or preferably for diphtheria and tetanus this spring. Is he likely to have any untoward reaction? What precautions should be taken?*

Henry Korchmal, M.D., Meriden, Conn.

Answer.—For the patient cited it is doubtful whether any severe reaction would be caused by a booster dose of diphtheria and tetanus toxoids. Nevertheless, it is well to observe caution. A Moloney skin test may indicate whether there is sensitivity to toxoid; however, intracutaneous injection of 0.1 cc. of the combined toxoids, plain, should be satisfactory for a booster. With this method, the possibility of the occurrence of unpleasant reactions is greatly diminished.

LABORATORY-ACQUIRED ANTHRAX

To the Editor:—*We have a bacteriologist with anthrax, self-inoculated in the laboratory, with the lesion just above the left eyebrow. We should appreciate knowing how often such laboratory infections with anthrax have been reported.*

M.D., Pennsylvania.

Answer.—At least 30 instances of laboratory-acquired anthrax have been recognized in the United States, as disclosed by a survey made in 1950 (Sulkin, S. E., and Pike, R. M.: *Am. J. Pub. Health* **41:**769, 1951). The majority of these occurred in one large laboratory engaged in special studies and have been described in the literature. Most of the 30 infections were cutaneous, and only one was fatal. The suspicion that one infection was acquired by handling stained smears was supported by demonstration of viable bacilli on such smears.